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Arizona State University

2001–2002 General Catalog

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President Lattie F. Coor

Tim Trumble photo

Dear ASU Students and Prospective Students:

It is my personal pleasure to introduce the Arizona State University 2001–2002 *General Catalog*. It is intended to put a great deal of important information at your fingertips and serve as a guide through your university experience.

The catalog compiles a rather imposing list of programs, courses, requirements, and services. We hope it is organized in a manner that makes it easy to find the information most applicable to you and your course of studies.

While the catalog will answer many of your questions, nothing will substitute for the guidance your advisor can provide. I strongly encourage you to work closely with an advisor to plan your academic program.

On behalf of Arizona State University, I wish you a challenging and fulfilling experience as you work to achieve your goals.

Sincerely,

A handwritten signature in black ink, appearing to read "Lattie F. Coor". The signature is written in a cursive, flowing style.

Lattie F. Coor
President

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¹ See the *Graduate Catalog*.

² See the *ASU West Catalog*.

Academic Organization

Organized under ASU Main, ASU East, ASU West, and ASU Extended Campus are colleges, schools, departments, and other administrative units whose faculty offer courses.

ASU Main

Barrett Honors College

College of Architecture and Environmental Design

School of Architecture
School of Design
School of Planning and Landscape Architecture

College of Business

Department of Economics
Department of Finance
Department of Management
Department of Marketing
Department of Supply Chain Management
School of Accountancy and Information Management
School of Health Administration and Policy

College of Education

Division of Curriculum and Instruction
Division of Educational Leadership and Policy Studies
Division of Psychology in Education

College of Engineering and Applied Sciences

Del E. Webb School of Construction
School of Engineering
Department of Bioengineering
Department of Chemical and Materials Engineering
Department of Civil and Environmental Engineering
Department of Computer Science and Engineering
Department of Electrical Engineering
Department of Industrial Engineering
Department of Mechanical and Aerospace Engineering

College of Extended Education

College of Law

College of Liberal Arts and Sciences

African American Studies Program
Department of Aerospace Studies
Department of Anthropology
Department of Biology
Department of Chemistry and Biochemistry
Department of Chicana and Chicano Studies
Department of English
Department of Exercise Science and Physical Education
Department of Family and Human Development
Department of Geography
Department of Geological Sciences
Department of History
Department of Languages and Literatures

Department of Mathematics
Department of Microbiology
Department of Military Science
Department of Philosophy
Department of Physics and Astronomy
Department of Plant Biology
Department of Political Science
Department of Psychology
Department of Religious Studies
Department of Sociology
Department of Speech and Hearing Science
Interdisciplinary Humanities Program
Women's Studies Program

College of Nursing

College of Public Programs

American Indian Studies Program
Asian Pacific American Studies Program
Department of Recreation Management and Tourism
Hugh Downs School of Human Communication
School of Justice Studies
School of Public Affairs
School of Social Work
Walter Cronkite School of Journalism and Telecommunication

Division of Undergraduate Academic Services

Academic Success at the University
Bachelor of Interdisciplinary Studies
Writing Across the Curriculum

Graduate College

Herberger College of Fine Arts

Department of Dance
Department of Theatre
School of Art
School of Music

ASU East

College of Extended Education

College of Technology and Applied Sciences

Department of Aeronautical Management Technology
Department of Electronics and Computer Engineering Technology
Department of Information and Management Technology
Department of Manufacturing and Aeronautical Engineering Technology

East College

Department of Nutrition
Faculty of Applied Psychology
Faculty of Business Administration
Faculty of Elementary Education

Faculty of Exercise and Wellness
Faculty of Multimedia Writing and Technical Communication

Morrison School of Agribusiness and Resource Management

ASU West

College of Arts and Sciences

Department of American Studies
Department of Integrative Studies
Department of Interdisciplinary Arts and Performance
Department of Life Sciences
Department of Social and Behavioral Sciences
Ethnic Studies Program
Interdisciplinary Studies Graduate Program
Religious Studies Program
Women's Studies Program

College of Education

Graduate Programs
Postbaccalaureate Programs for Teacher Certification
Undergraduate Professional Teacher Preparation

College of Extended Education

College of Human Services

Department of Administration of Justice
Department of Communication Studies
Department of Recreation and Tourism Management
Department of Social Work
Gerontology Program
Nursing (ASU Main Program)

Division of Collaborative Programs

Applied Science Program
Barrett Honors College
Center for Writing Across the Curriculum
Research Consulting Center
University-College Center

School of Management

Accountancy
Business Administration
Global Business

ASU Extended Campus

College of Extended Education

Academic and Professional Programs
American English and Culture Program
Distance Learning Technology
Extended Campus Programs
Independent Learning

ASU Baccalaureate Degrees

Baccalaureate degrees, majors, and concentrations offered by ASU Main, ASU East, and ASU West and through ASU Extended Campus are shown in the “ASU Baccalaureate Degrees” table below, organized by the name of the major. The table points to the primary page where more information can be found. The table shows only officially approved concentrations; other informal areas of study may also be available. Where indicated, the approved area of study is called an “emphasis” or some other name in place of “concentration.” For graduate degrees, see the “ASU Graduate Degrees” table, page 511.

ASU offers these baccalaureate degrees, abbreviated in the table below and elsewhere in the catalog:

Bachelor of Applied Science (B.A.S.)
 Bachelor of Arts (B.A.)
 Bachelor of Arts in Education (B.A.E.)
 Bachelor of Fine Arts (B.F.A.)
 Bachelor of Interdisciplinary Studies (B.I.S.)
 Bachelor of Music (B.M.)
 Bachelor of Science (B.S.)
 Bachelor of Science in Design (B.S.D.)
 Bachelor of Science in Engineering (B.S.E.)
 Bachelor of Science in Landscape
 Architecture (B.S.L.A.)
 Bachelor of Science in Nursing (B.S.N.)
 Bachelor of Science in Planning (B.S.P.)
 Bachelor of Social Work (B.S.W.)

ASU Baccalaureate Degrees

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Aeronautical Management Technology ¹	B.S.	Airway science flight management, airway science management	East	637
Aerospace Engineering ¹	B.S.E.	—	Main	255
African American Studies	B.A.	Humanities/arts, politics and society, social and behavioral sciences	Main	330
Agribusiness	B.S.	Agribusiness finance, e-commerce, food and agribusiness marketing, food science, general agribusiness, golf and facilities management, international agribusiness, management of agribusiness, preveterinary medicine, professional golf management, resource management	East	608
American Indian Studies	B.S.	—	Main	471
American Studies	B.A.	Emphases: American cultures, American lives, American systems, writing	West	669
Anthropology	B.A.	—	Main	333
Applied Psychology	B.S.	—	East	622
Applied Science	B.A.S.	Aviation maintenance management technology	East	639
		Aviation management technology	East	639
		Computer systems administration	East	644
		Consumer products technology	East	614
		Digital media management	East	650
		Digital publishing	East	651
		Emergency management	East	651
		Fire service management	East	651
		Food retailing	East	614
		Instrumentation	East	644
		Microcomputer systems	East	644
		Multimedia writing and technical communication	East	628
		Municipal operations management	East	651
		Operations management	East	650
		Production technology	East	657

¹ This major requires more than 120 semester hours to complete.

² Applications for this program are not being accepted at this time.

³ This program is administered by ASU Main.

ASU Baccalaureate Degrees (continued)

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		All minors available at ASU West, individualized concentration	West	669
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Art	B.A.	Art history, digital arts, museum studies, studio art	Main	270
	B.F.A.	Art education, ceramics, drawing, fibers, intermedia, metals, painting, photography, printmaking, sculpture	Main	271
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Biochemistry	B.S.	—	Main	345
Bioengineering ¹	B.S.E.	—	Main	215
Biology	B.S.	Biology and society	Main	340
Broadcasting	B.A.	Broadcast journalism, business/management	Main	478
Business Administration	B.S.	—	East	623
Chemical Engineering ¹	B.S.E.	—	Main	220
Chemistry	B.A., B.S.	—	Main	345
Chicana and Chicano Studies	B.A.	Humanities/cultural sciences, social sciences/policy	Main	351
Civil Engineering ¹	B.S.E.	Construction engineering, environmental engineering	Main	230
Clinical Laboratory Sciences	B.S.	—	Main	410
Communication	B.A., B.S.	—	Main	473
			Extended	683
Communication Studies	B.A., B.S.	Emphases: communication and culture; communication and organizations; communication and relationships; rhetoric, philosophy, and media studies	West	669
Computer Engineering Technology ¹	B.S.	Computer hardware technology, embedded systems technology, software technology	East	643
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			Main	352
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Conservation Biology	B.S.	—	Main	340
Construction ¹	B.S.	General building construction, heavy construction, residential construction, specialty construction	Main	207
Dance	B.F.A.	Choreography, dance education, dance studies, performance	Main	285
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			Main	353
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			Extended	684
			East	623

¹ This major requires more than 120 semester hours to complete.

² Applications for this program are not being accepted at this time.

³ This program is administered by ASU Main.

ASU Baccalaureate Degrees (continued)

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Engineering Interdisciplinary Studies ²	B.S.	—	Main	203
Engineering Special Studies ¹	B.S.E.	Premedical engineering	Main	263
English	B.A.	Linguistics, literature	Main Extended	354 685
Environmental Resources	B.S.	Ecology, watershed ecology, wildlife habitat management	West	669
Exercise and Wellness	B.S.	—	East	612
Exercise Science/Physical Education	B.S.	Exercise science, physical education	East	625
Family and Human Development	B.S.	Family studies/child development	Main	360
Finance	B.S.	—	Main	364
French	B.A.	—	Main	163
Geography	B.A., B.S.	Meteorology-climatology, urban studies	Main	385
Geological Sciences	B.S.	—	Main	366
German	B.A.	—	Main	372
Global Business	B.S.	Financial management, human resources management, information systems management, international studies, marketing	Main	385
Graphic Design	B.S.D.	—	West	669
History	B.A.	—	Main Extended	375 684
Housing and Urban Development	B.S.D.	—	Main Extended	139 684
Humanities	B.A.	—	Main	382
Industrial Design	B.S.D.	—	Main	130
Industrial Engineering ¹	B.S.E.	—	Main	250
Industrial Technology	B.S.	Environmental technology management, graphic information technology, industrial technology management	East	649
Integrated Studies	B.A., B.S.	—	Main	324
Integrative Studies	B.A.	All minors available at ASU West, individualized concentration	West Extended	669 685
Interdisciplinary Arts and Performance	B.A.	Media, music, performance studies, theater/performance, visual art	West	669
Interdisciplinary Studies	B.I.S.	See the “B.I.S. Concentrations” table, page 109.	Main East Extended	108 620 683
Interior Design ¹	B.S.D.	—	Main	130
Italian	B.A.	—	Main	386
Journalism	B.A.	News editorial, public relations, visual journalism	Main	478
Justice Studies	B.S.	—	Main	482
Landscape Architecture	B.S.L.A.	—	Main	140
Life Sciences	B.S.	Emphases: cell biology and physiology, ecology and organismal biology, human biology and environment	West	669
Management	B.S.	—	Main	168
Manufacturing Engineering Technology ¹	B.S.	Manufacturing engineering technology, mechanical engineering technology	East	656
Marketing	B.S.	—	Main	173

¹ This major requires more than 120 semester hours to complete.

² Applications for this program are not being accepted at this time.

³ This program is administered by ASU Main.

ASU Baccalaureate Degrees (continued)

Major	Degree	Concentration	Campus	Page
Materials Science and Engineering ¹	B.S.E.	—	Main	224
Mathematics	B.A.	—	Main	401
	B.S.	Computational mathematical sciences	Main	402
Mechanical Engineering ¹	B.S.E.	—	Main	257
Microbiology	B.S.	—	Main	410
Molecular Biosciences/ Biotechnology	B.S.	—	Main	415
Multimedia Writing and Technical Communication	B.S.	—	East	620
Music	B.A.	—	Main	291
Music Education	B.M.	Choral-general, instrumental, string	Main	291
Music Therapy	B.M.	—	Main	292
Nursing	B.S.N.	—	Main	457
			West ³	669
Nutrition	B.S.	Dietetics, food and nutrition management, human nutrition	East	629
Performance	B.M.	Guitar, jazz, keyboard, music theatre, orchestral instrument, piano accompanying, voice	Main	293
Philosophy	B.A.	—	Main	417
Physics	B.S.	—	Main	420
		—	Main	420
Plant Biology	B.S.	Environmental science and ecology, plant biochemistry and molecular biology, urban horticulture	Main	426
Political Science	B.A.	—	Main	430
	B.S.	Public policy advocacy and lobbying, public policy analysis	Extended	685
Politics	B.A., B.S.	—	West	669
Psychology	B.A., B.S.	—	Main	437
			West	669
			Extended	685
Real Estate	B.S.	—	Main	175
Recreation	B.S.	Recreation management, tourism	Main	488
Recreation and Tourism Management	B.S.	—	West	669
Religious Studies	B.A.	—	Main	442
Russian	B.A.	—	Main	386
Secondary Education	B.A.E.	Academic specializations: biological sciences, business education, chemistry, Chinese, ² economics, English, family and human development (home economics), ² French, geography, German, history, Japanese, journalism, mathematics, mathematics/chemistry, mathematics/physics, physical education, physics, physics/chemistry, political science, Russian, ² social studies, Spanish	Main	183
		Academic specializations: biological sciences, English, history, mathematics, social studies	West	669
		Option: middle school education	West	669
Selected Studies in Education ²	B.A.E.	—	Main	185
Social and Behavioral Sciences	B.A., B.S.	Emphases: interdisciplinary behavioral sciences, interdisciplinary social sciences	West	669
Social Work	B.S.W.	—	Main	492
			West	669
			Extended	684

¹ This major requires more than 120 semester hours to complete.

² Applications for this program are not being accepted at this time.

³ This program is administered by ASU Main.

ASU Baccalaureate Degrees (continued)

Major	Degree	Concentration	Campus	Page
Sociology	B.A.	—	Main	445
			West	669
			Extended	685
Spanish	B.A.	—	West	669
			Main	386
			West	669
Special Education	B.A.E.	—	Main	184
			West	669
Speech and Hearing Science	B.S.	—	Main	449
Supply Chain Management	B.S.	—	Main	175
Theatre	B.A., B.F.A. ²	—	Main	305
Theory and Composition	B.M.	Composition, theory	Main	296
Urban Planning	B.S.P.	—	Main	139
Women's Studies	B.A.	—	Main	452
			West	669
	B.S.	—	West	669

¹ This major requires more than 120 semester hours to complete.

² Applications for this program are not being accepted at this time.

³ This program is administered by ASU Main.



The baccalaureate degree marks the completion of one path, but can also lead to higher educational pursuits.

Tim Trumble photo

University Calendar

April 2001

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

May 2001

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

June 2001

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

July 2001

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August 2001

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September 2001

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

2001

Check the 2001 *Summer Sessions Bulletin* for details and to confirm these dates.

Mon., Feb. 5–
Wed., May 30

Registration and drop/add for first five-week session and eight-week session

Mon., Feb. 5–
Tues., July 3

Registration and drop/add for second five-week session

Tues., Apr. 24

Final tuition payment deadline for all summer sessions (For students who register on or after the deadline, fees are due daily)

Mon., May 28

Memorial Day Holiday

Tues., May 29

Instruction begins for first five-week session and eight-week session

Tues., June 5

Unrestricted course and complete withdrawal deadline for first five-week session

Tues., June 5

Unrestricted course and complete withdrawal deadline for eight-week session

Fri., June 15

Restricted course withdrawal deadline for first five-week session and eight-week session

Fri., June 22

Restricted complete withdrawal deadline for first five-week session

Fri., June 29

First five-week session ends

Mon., July 2

Instruction begins for second five-week session

Wed., July 4

Classes are excused for Independence Day

Fri., July 6

August graduation filing deadline (must be met to have name appear in commencement program)

Mon., July 9

Unrestricted course and complete withdrawal deadline for second five-week session

Fri., July 13

Restricted complete withdrawal deadline for eight-week session

Fri., July 20

Eight-week session ends

Fri., July 20

Restricted course withdrawal deadline for second five-week session

Fri., July 27

Restricted complete withdrawal deadline for second five-week session

Fri., Aug. 3

Second five-week session ends

Fri., Aug. 3

Commencement

2001

Fall Semester

Check the fall 2001 *Schedule of Classes* for details and to confirm these dates.

Thurs., Mar. 29–

Preregistration

Fri., Apr. 6

Mon., Apr. 23–

Drop/add

Sun., Aug. 26

Wed., Apr. 25–

Registration

Sun., Aug. 26

Tues., July 31

Final tuition payment deadline for fall 2001 (For students who register on or after the deadline, fees are due daily)

Wed., Aug. 15

Residence halls open

Thurs., Aug. 16

New Faculty and Academic Professional Orientation and Reception

October 2001

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November 2001

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December 2001

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

January 2002

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February 2002

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March 2002

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Thurs., Aug. 16–
Sun., Aug. 19

Mon., Aug. 20

Mon., Sept. 3

Fri., Sept. 14

Mon., Oct. 1

Mon., Oct. 15–

Fri., Oct. 19

Fri., Oct. 19

Fri., Oct. 26

Mon., Nov. 12

Thurs., Nov. 22–

Fri., Nov. 23

Wed., Nov. 28

Tues., Dec. 4

Wed., Dec. 5

Thurs., Dec. 6–

Sat., Dec. 8;

Mon., Dec. 10–

Wed., Dec. 12

Thurs., Dec. 13

Fri., Dec. 14

Sat., Dec. 15

Thurs., Dec. 27

2002

Check the spring 2002 *Schedule of Classes* for details and to confirm these dates.

Mon., Oct. 29–

Tues., Nov. 6, 2001

Mon., Nov. 19, 2001–

Fri., Jan. 18, 2002

Wed., Nov. 21, 2001–

Fri., Jan. 18, 2002

Tues., Dec. 18, 2001

Tues., Jan. 1, 2002

Wed., Jan. 9

Fri., Jan. 11

Fri., Jan. 11

Mon., Jan. 14

Mon., Jan. 21

Fri., Feb. 8

Sun., Mar. 10–

Sun., Mar. 17

Fri., Mar. 22

Fri., Mar. 29

ASU Welcome Week 2001

Instruction begins

Classes are excused for Labor Day

Unrestricted withdrawal deadline

Winter session (College of Extended Education [CEE]) registration begins

Semester midpoint

December graduation filing deadline (must be met to have name appear in commencement program)

Restricted course withdrawal deadline

Classes are excused for Veterans Day

Classes are excused for Thanksgiving recess

Restricted complete withdrawal deadline

Instruction ends

Reading day

Final examinations

Commencement (4 P.M.)

Some residence halls close for semester break

Midyear recess begins

Winter session (CEE) instruction begins

Spring Semester

Preregistration

Drop/add

Registration

Final tuition payment deadline for spring 2002
(For students who register on or after the deadline, fees are due daily)

Winter session classes are excused for New Year's Day

Residence halls open

Orientation for new students

Winter session (CEE) instruction ends

Instruction begins

Classes are excused for Martin Luther King Jr. Day

Unrestricted withdrawal deadline

Classes are excused for spring recess; semester midpoint

May graduation filing deadline (must be met to have name appear in commencement program)

Restricted course withdrawal deadline

April 2002

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May 2002

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June 2002

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July 2002

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August 2002

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Thurs., Apr. 25

Tues., Apr. 30

Wed., May 1

Thurs., May 2–

Sat., May 4;

Mon., May 6–

Wed., May 8

Thurs., May 9

Fri., May 10

2002Check the 2002 *Summer Sessions Bulletin* for details and to confirm these dates.

Mon., Feb. 4–

Wed., May 29

Mon., Feb. 4–

Tues., July 2

Tues., Apr. 30

Mon., May 27

Tues., May 28

Tues., June 4

Fri., June 14

Fri., June 21

Fri., June 28

Mon., July 1

Thurs., July 4

Fri., July 5

Mon., July 8

Fri., July 12

Fri., July 19

Fri., July 19

Fri., July 26

Fri., Aug. 2

Fri., Aug. 2

Restricted complete withdrawal deadline

Instruction ends

Reading day

Final examinations

Commencement

Residence halls close

Summer SessionsCheck the 2002 *Summer Sessions Bulletin* for details and to confirm these dates.Registration and drop/add for first five-week session
and eight-week session

Registration and drop/add for second five-week session

Final tuition payment deadline for all summer sessions
(For students who register on or after the deadline,
fees are due daily)

Memorial Day Holiday

Instruction begins for first five-week session and eight-week session

Unrestricted course and complete withdrawal deadline for first five-
week session and eight-week sessionRestricted course withdrawal deadline for first five-week session and
eight-week session

Restricted complete withdrawal deadline for first five-week session

First five-week session ends

Instruction begins for second five-week session

Classes are excused for Independence Day

August graduation filing deadline (must be met to have name appear
in commencement program)Unrestricted course and complete withdrawal deadline for second
five-week session

Restricted complete withdrawal deadline for eight-week session

Eight-week session ends

Restricted course withdrawal deadline for second five-week session

Restricted complete withdrawal deadline for second five-week
session

Second five-week session ends

Commencement

Frequently Asked Questions

How do I apply to ASU Main?

Complete an application and have all required transcripts and test scores sent directly to Undergraduate Admissions. See “Undergraduate Admission,” page 54. For more information, call 480/965-7788.

How do I apply to ASU East?

Complete an application and have all required transcripts and test scores sent directly to Undergraduate Admissions. See “Undergraduate Admission,” page 54. For more information, call 480/727-3278.

How do I apply to ASU West?

Contact the Admissions and Records Office at ASU West. See “Admission and Advising,” page 670. For more information, call 602/543-8203.

What is the ASU Extended Campus?

The ASU Extended Campus offers courses and degrees evenings and weekends, by television, the Internet, at on- and off-campus sites, and through Independent Learning. See “ASU Extended Campus,” page 23, and “ASU Extended Campus,” page 683, or call 480/965-9696 for information and a course catalog.

What if I am a transfer student?

Upon admission, note the number of semester hours on your Certificate of Admission. When registering, consult your department advisor to determine how transfer credits fit into the curriculum (see “Academic Advising,” page 64). Have you met the First-Year Composition requirement? (See “First-Year Composition Requirement,” page 74.) If you have completed 87 or more semester hours, file a program of study or declaration of graduation (see “Declaration of Graduation,” page 76, and “Program of Study Requirements,” page 76).

What if I have a disability or am a veteran?

If you have a disability and will be requesting academic accommodations, see “Disability Resources for Students,” page 39, and “Applicants with Disabilities,” page 60. Veteran students using GI benefits, see “Veterans Services,” page 36.

How do I get financial aid?

In addition to applying for admission, complete the Free Application for Federal Student Aid (FAFSA) by February 15. You may obtain a paper FAFSA from any financial aid office or complete an electronic application at www.fafsa.ed.gov. See “Student Financial Assistance,” page 36, and “Financial Aid,” page 48.

How do I find a place to live and purchase a meal plan?

Apply early (before March 1, 2001) for the best chance to live on campus beginning in fall semester 2001. Housing is not guaranteed. See “Residential Life,” page 36, for information on student housing. Meal plans may be purchased in advance for ASU Main or upon arrival on campus. For more

information about Main campus options, call Residential Life at 480/965-3515, and Campus Dining Services at 480/965-3464. For ASU East housing, call 480/727-1700, or see “Campus and Student Services,” page 605, in the “ASU East” section, for more information on dining and housing.

What about orientation?

Attend ASU Main orientation, where questions regarding advising, class registration, student IDs, on-campus housing, and other pertinent topics are answered. See “Orientation,” page 60. Information regarding ASU East orientation can be obtained by calling 480/727-1041.

How do I get an ID, and what about parking?

See “Proof of Identification,” page 66, about obtaining an ASU student ID card. If you are planning to park at ASU Main, purchase a parking decal. See “Parking Decals,” page 44. Parking on ASU East campus is free. ASU East students may obtain student ID cards at the OASIS in the Center Building.

What about placement examinations and university testing requirements?

See “Placement Examinations,” page 64, and “University Testing Requirements,” page 63.

Before I register for classes, how do I get an advisor?

Call the college of your major to schedule an appointment with an academic advisor. See “Academic Advising,” page 64. For ASU East Academic Advising, see “Advising,” page 605.

When and how do I register?

See the *Schedule of Classes* for registration procedures and dates or access registration information online at www.asu.edu/registrar. Remember that you must first provide proof of measles immunity to the Student Health and Wellness Center. See “Immunization Requirements,” page 60.

Once I am registered and ready to go, how can I ensure my success at ASU?

Consider enrolling in UNI 100 Academic Success at the University. See “Division of Undergraduate Academic Services,” page 107.

What's left to do now that the business is taken care of?

Become involved in the university by getting to know professors, joining student organizations, and taking advantage of the many cultural, recreational, and social opportunities. For more information on ASU Main campus life, call Student Life at 480/965-6547, REACH at 480/965-2255, or ASASU at 480/965-3161; for ASU East, call 480/727-3278. Investigate the challenges and advantages of the Barrett Honors College. See the “The Craig and Barbara Barrett Honors College,” page 112.

Academic Definitions

Academic Renewal. Under certain circumstances an undergraduate who has been readmitted to the university after an absence of at least five years may have the former record treated in the same manner as transfer credits. See “Academic Renewal,” page 66.

Advanced Placement. Students who have taken an advanced placement course of the College Entrance Examination Board (CEEB) in their secondary school and who have taken an Advanced Placement Examination of CEEB may receive university credit. See “Advanced Placement,” page 61.

AECP. The American English and Culture Program (AECP) features an intensive course of study designed for adult international students who desire to become proficient in English as a second language. See “American English and Culture Program,” pages 59 and 688.

ASU East. ASU East is located at the former Williams Air Force Base. See “ASU East,” pages 22 and 603.

ASU Extended Campus. The ASU Extended Campus offers courses evenings and weekends, by television, the Internet, at on- and off-campus sites, and through Independent Learning. See “ASU Extended Campus,” pages 23 and 683.

ASU Main. ASU Main is the principal campus of ASU, located in Tempe. See “ASU Main,” page 22.

ASU West. ASU West is the Phoenix campus of ASU, established in 1984 by the Arizona Legislature to serve the educational needs of residents in western Maricopa County. See “ASU West,” pages 22 and 668.

Audit Enrollment. A student who audits a course attends regularly scheduled class sessions but earns no credit. See “Audit Enrollment,” page 68.

Buckley Amendment. See “Family Educational Rights and Privacy Act” in this section.

CLEP. As part of the College-Level Examination Program (CLEP), students who have taken a College-Level Examination of the College Entrance Examination Board may receive university credit. See “College-Level Examination Program (CLEP),” page 61.

Comprehensive Exam. A comprehensive examination is intended to permit a student to establish academic credit in a field in which the student has gained experience or competence equivalent to an established university course. See “Comprehensive Examinations,” page 61.

Concentration. A concentration is a selection of courses within a major.

Cooperative Education. Cooperative Education is any educational program that requires alternating classroom and work experience in government or industry. The work experience exists for its educational value. See “Cooperative Programs,” page 67.

Corequisite. A requirement to be met *while* taking one course, such as taking another particular course, is a corequisite. See also “Prerequisite” in this section.

Course Prefix. A course prefix is a three-letter designation assigned by each instruction unit. The “Course Prefix Index,” page 6, provides a comprehensive list. See also “Cross-Listing” in this section.

Credit Enrollment. One semester hour represents a minimum of one 50-minute class exercise per week per semester. A minimum of 120 semester hours is required for graduation with a baccalaureate degree. To obtain credit, a student must be properly registered and pay fees for the course.

Cross-Listing. One course may have more than one course prefix and may be offered by more than one department. Some instruction units require students to enroll in a course under a certain prefix to receive credit properly. Catalog course descriptions indicate courses that are cross-listed.

Cum Laude. An undergraduate student with a minimum of 60 semester hours of course work at ASU and a cumulative GPA of 3.40–3.59 graduates *cum laude*. See “Graduation with Academic Recognition,” page 77. See also “Magna Cum Laude” and “Summa Cum Laude” in this section.

Declaration of Graduation. The Declaration of Graduation uses the Degree Audit System (DARS). DARS is an automated process that matches courses a student has completed with the requirements of a particular academic degree program, resulting in a report that shows the student which requirements are satisfied and which requirements remain to be fulfilled. A student must file a Declaration of Graduation or a Program of Study within the semester the student earns his or her 87th hour. See “Declaration of Graduation,” page 76.

Drop/Add. Drop/add is a process in which a student who has registered for courses for a semester or summer session may drop or add courses through the first week of classes in a semester or the first two days of a summer session. See “Drop/Add,” page 68.

Family Educational Rights and Privacy Act. The Family Educational Rights and Privacy Act of 1974, or Buckley Amendment, sets forth the requirements governing the protection of the privacy of the education records of students who are or have been in attendance at ASU. See “Student Records,” page 73.

Freshman. A student who has earned 24 or fewer hours is a freshman.

General Studies Requirement. This is a requirement of all undergraduates. See “Meeting the General Studies Requirement,” page 78.

GPA. The ASU grade point average (GPA) is obtained by dividing the total number of ASU grade points earned by the number of ASU semester hours graded. Grade point averages are rounded to the nearest hundredth of a grade point. See “Grade Point Average,” page 69.

Grade Points. For the purpose of computing the GPA, grade points are assigned to each of the grades for each semester hour as follows: “A,” four points; “B,” three points; “C,” two points; “D,” one point; and “E,” zero points.

Graduate Catalog. The *Graduate Catalog* describes the procedures and requirements for enrollment in the Graduate College. See “Graduate College,” page 498.

Graduate-Level Courses. Courses numbered 500–799 are designed for graduate students. However, an upper-division undergraduate student may enroll in graduate courses with the approval of his or her advisor, the course instructor, the department chair, and the dean of the college or school in which the course is offered. See “500–799 (Graduate-Level) Courses,” page 51.

Incomplete. A mark of “I” (incomplete) is given by the instructor only when a student who is otherwise doing acceptable work is unable to complete a course because of illness or other conditions beyond the student’s control. See “Incomplete,” page 67.

International Baccalaureate. Students who have taken a higher-level examination through the International Baccalaureate program may receive university credit. See “International Baccalaureate Diploma/Certificate,” page 61.

Junior. A student who has earned 56–86 hours is a junior.

Lower-Division Courses. Courses numbered 100–299 are designed primarily for freshmen and sophomores. See “100–299 (Lower-Division) Courses,” page 51.

Magna Cum Laude. A student with a minimum of 60 semester hours of course work at ASU and a cumulative GPA of 3.60–3.79 graduates *magna cum laude*. See “Graduation with Academic Recognition,” page 77. See also “Cum Laude” and “Summa Cum Laude” in this section.

Major. A major is a specialized group of courses contained within the program of study. Refer to college and school sections for specific descriptions and requirements.

Minor. A minor is a specialized group of courses contained within the program of study available from some instruction units. See “Minors,” page 102, and refer to college and school sections for specific descriptions and requirements.

Nonresident Tuition. This term refers to the charge assessed to nonresident students, as established in Arizona Board of Regents’ Policy 4-102. See also “Resident Tuition” in this section.

Omnibus Course. An omnibus course is offered on an experimental or tutorial basis when the course content is new or periodically changes. See “Omnibus Courses,” page 51.

Pass/Fail Enrollment. A mark of “P” (pass) or “E” (fail) may be assigned for this grading option. This grading method may be used at the option of individual colleges and schools within the university. See “Pass/Fail Enrollment,” page 68.

Placement Examination. A proficiency examination is given to waive a course requirement, validate certain transfer credits in professional programs, or determine a student’s ability in a field where competence is an important consideration. See “Placement Examinations,” page 64.

Prerequisite. A requirement to be met *before* registering for one course, such as completing another particular course, is a prerequisite. See also “Corequisite” in this section.

Probation. A student’s college assumes responsibility for enforcing academic standards and may place any student on probation who has failed to maintain good standing. A student on academic probation is required to observe any rules or limitations the college may impose as a condition for retention. See “Probation,” page 72.

Program of Study. The complete array of courses included in the study leading to a degree make up a student’s program of study. A student must file an Undergraduate Program of Study or a Declaration of Graduation within the semester the student earns his or her 87th hour. See “Program of Study Requirements,” page 76.

Resident Tuition. This term refers to the charge assessed to resident students who register for classes at ASU. See also “Nonresident Tuition” in this section.

Restricted Complete Withdrawal. From the fifth week to the transaction deadline for a semester and from the seventh day to the transaction deadline for a summer session, students may withdraw from all courses but receive a mark of “W” only from courses in which the instructor certifies that they are passing at the time of the withdrawal. See “Restricted Withdrawal,” page 68.

Restricted Course Withdrawal. From the fifth week to the end of the 10th week of a semester and from the seventh day to the end of the third week of a summer session, students may withdraw with a mark of “W” only from courses in which the instructor certifies that they are passing at the time of withdrawal. See “Restricted Withdrawal,” page 68.

Senior. A student who has earned 87 or more hours of credit is a senior.

Sophomore. A student who has earned 25–55 hours of credit is a sophomore.

Summa Cum Laude. A student with a minimum of 60 semester hours of course work at ASU and a cumulative GPA of 3.80–4.00 graduates *summa cum laude*. See “Graduation with Academic Recognition,” page 77. See also “Cum Laude” and “Magna Cum Laude” in this section.

TOEFL. The Test of English as a Foreign Language (TOEFL) is taken by students whose native language is not English. See “TOEFL,” page 59, and “AECF” in this section.

Transcript. An official transcript lists in chronological order all courses taken at ASU. It includes all grades received. It is signed and dated by the Registrar and displays the embossed seal of the university. Unofficial transcripts include all information shown on the official transcript, plus information concerning changes, additions, etc., to the record. See “Transcripts,” page 71.

Unrestricted Course Withdrawal. During the first four weeks of a semester or the first six days of a summer session, a student may withdraw from any course with a mark of “W.” See “Unrestricted Course Withdrawal,” page 68.

Upper-Division Courses. Courses numbered 300–499 are designed primarily for juniors, seniors, and other advanced students. See “300–499 (Upper-Division) Courses,” page 51.

General Information

MISSION

Arizona State University has emerged as a leading national and international research and teaching institution with a primary focus on Maricopa County, Arizona's dominant population center. This rapidly growing, multicampus public research university offers programs from the baccalaureate through the doctorate for approximately 49,700 full-time and part-time students through ASU Main in Tempe; ASU West in northwest Phoenix; a major educational center in downtown Phoenix; ASU East, located at the Williams Campus (formerly Williams Air Force Base) in southeast Mesa; and other instructional, research, and public service sites throughout Maricopa County. ASU is a modern university that applies its research capabilities to the rapidly evolving needs of Maricopa County and the state.

Arizona State University's goal is to become a world-class university in a multicampus setting, one of the very best public universities in the nation. Its mission is to provide outstanding programs in instruction, research, and creative activity, to promote and support economic development, and to provide service appropriate for the nation, the state of Arizona, and the state's major metropolitan area. To fulfill its mission, ASU places special emphasis on the core disciplines and offers a full range of degree programs—baccalaureate through doctorate. To become competitive with the very best public universities, ASU recognizes that it must offer quality programs at all degree levels in a broad range of fundamental fields of inquiry. ASU will continue to dedicate itself to superior instruction; to excellent student performance; to original research, creative endeavor, and scholarly achievement; and to outstanding public service and economic development activities. As a result of this dedication, ASU was awarded the prestigious Research I (now referred to as Research Extensive) university status in 1994, recognizing ASU as a premier research institution.

ORGANIZATION

Arizona State University is part of a university system governed by the Arizona Board of Regents, a body with perpetual succession under the constitution and laws of Arizona. The board consists of eight citizens appointed by the governor of the state for terms of eight years, and two students with the elected governor and state superintendent of public instruction as members *ex officio*.

The regents select and appoint the president of the university, who is the liaison between the Arizona Board of Regents and the institution. The president is aided in the administrative work of the institution by the provosts, vice presidents, deans, directors, department chairs, faculty, and other officers. Refer to "Administrative Personnel," page 595.

The academic units develop and implement the teaching, research, and service programs of the university, aided by the university libraries, museums, and other services.

The faculty and students of the university play an important role in educational policy, with an Academic Senate, joint university committees and boards, and the Associated Students serving the needs of a large institution.

ACADEMIC ACCREDITATION AND AFFILIATION

See "Accreditation and Affiliation," page 693.

EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION

It is the policy of ASU to provide equal opportunity through affirmative action in employment and educational programs and activities. Discrimination is prohibited on the basis of race, color, religion, national origin, citizenship, sex, sexual orientation, age, disability, special disabled veteran, other eligible veteran, or Vietnam-era veteran status. Equal employment opportunity includes but is not limited to recruitment, hiring, promotion, termination, compensation, benefits, transfers, university-sponsored training, education, tuition assistance, and social and recreational programs.

ASU is committed to taking affirmative action in increasing opportunities at all levels of employment and to increasing participation in programs and activities by all faculty, staff, and students. Affirmative action is directed toward minority persons, women, special disabled veterans, other eligible veterans, Vietnam-era veterans, and persons with disabilities.

University Policy Prohibiting Discriminatory Harassment

Harassment Prohibited. Subject to the limiting provisions of "Freedom of Speech and Academic Freedom" specified below, it is a violation of university policy for any university employee or student to subject any person to harassment on university property or at a university-sponsored activity.

Harassment Defined. Actions constitute harassment if (1) they substantially interfere with another's educational or employment opportunities, peaceful enjoyment of residence, physical security, and (2) they are taken with a general intent to engage in the actions and with the knowledge that the actions are likely to substantially interfere with a protected interest identified above. Such intent and knowledge may be inferred from all the circumstances.

Freedom of Speech and Academic Freedom. Neither this nor any other university policy is violated by actions that amount to expression protected by the state or federal constitutions or by related principles of academic freedom. This limitation is further described in the ASU First Amendment Guidelines, the current version of which supplements this policy and is available in the Office of the General Counsel.

Relationship to the Work of the Campus Environment Team. If harassment is discriminatory, it falls within the education, monitoring, reporting, and referral functions of the Campus Environment Team. Harassment is discriminatory if taken with the purpose or effect of differentiating on the basis of another person's race, sex, color, national origin, religion, age, sexual orientation, disability, or Vietnam-era veteran status.

INTERGROUP RELATIONS CENTER

The only center of its kind on a college campus, the Intergroup Relations Center (IRC) works with students, staff, and faculty to promote positive intergroup relations, to prepare students for living in a diverse democracy, to create greater understanding between the different groups that exist at ASU, and to provide faculty, staff, and students opportunities to explore the rich diversity that is part of the ASU campus community. Through structured interaction programs, including intergroup dialogues, story circles, retreats, and institutes and via educational and training workshops, the center promotes diversity as one of the university's greatest assets. The educational work of the center encompasses gender, race/ethnicity, sexual orientation, age, disability status, nationality, adult reentry, and other salient social identities found at ASU.

Some of the programs and initiatives offered by the center include Voices of Discovery, a six-week student intergroup dialogue program that brings together small groups of African Americans and white/EuroAmericans, males and females, American Indians and white/EuroAmericans, Latinos and white/EuroAmericans, gays, lesbians, bisexuals, heterosexuals, and other groups to interact with and learn about each other. Leadership 2000, an annual four-day, off-campus retreat brings together 80 students from many different backgrounds to explore their own and others' diversity. Allies in Action, a diverse group of students sponsored by the IRC, works together to improve intergroup relations on the campus. Intergroup Relations Theatre and Music programs use the arts to interactively involve, entertain, and educate participants about issues of diversity. The center also offers programs for faculty and staff addressing issues of diversity in the workplace and the classroom and custom-designed programs, consultation, and intergroup conflict mediation services for a wide range of campus offices, academic departments, and student groups.

For more information, visit the center in SSV 278, call 480/965-1574, or access the IRC Web site at www.asu.edu/provost/intergroup.

HISTORY OF ARIZONA STATE UNIVERSITY

On February 26, 1885, House Bill 164, "An Act to Establish a Normal School in the Territory of Arizona," was introduced in the 13th Legislative Assembly of Arizona Territory by John Samuel Armstrong. The bill, strongly supported by Charles Trumbull Hayden of Tempe, passed the House on March 6 and the Council on March 11 and was signed by Governor F.A. Tritle on March 12, 1885, thereby founding the institution known today as Arizona State University. Under the supervision of Principal Hiram Bradford Farmer, instruction was instituted on February 8, 1886, when 33 students met in a single room on land donated by George and Martha Wilson of Tempe.

The institution began with the broad obligation to provide "instruction of persons...in the art of teaching and in all the various branches that pertain to good common school education; also, to give instruction in the mechanical arts and in husbandry and agricultural chemistry, the fundamental law of the United States, and in what regards the rights and duties of citizens."

With the growth of the state, especially the surrounding Phoenix metropolitan area, the school has carried forward

this charter, accompanied by successive changes in scope, name, and governance.

The Early Years. For the first 14 years, the school was governed by six principals. At the turn of the century and with another new name, Normal School of Arizona, President Arthur John Matthews brought a 30-year tenure of progress to the school.

He assisted in changing the school to an all-college student status; the Normal School had enlisted high school students who had no other secondary educational facilities in Arizona. He embarked on a building schedule that included the state's first dormitories. Of the 18 buildings constructed while Matthews was president, six are still in use. His legacy of an "evergreen campus," with the import of many shrubs and trees and the planting of Palm Walk, continues to this day: the main campus is a nationally recognized arboretum.

Matthews also saw to it that the Normal School was accredited outside the state. His service on national education organization boards was conducive to this recognition. The school remained a teacher's college in fact and theory during Matthews' tenure, although the struggle to attain status as a university was ongoing.

An extraordinary event occurred March 20, 1911, when former President Theodore Roosevelt visited the Tempe school and spoke from the steps of Old Main. He had dedicated the Roosevelt Dam the day before and was impressed with Arizona. He noted that construction of the dam would benefit central Arizona's growth and that of the Normal School. It would be another year before the territory became a state.

During the Great Depression, Ralph W. Swetman was hired as president for a three-year term. This was a time of uncertainty for educational institutions. Although enrollment increased due to the depression, many faculty were terminated and faculty salaries were cut. The North Central Association became the accrediting agency for Arizona State Teachers College.

The Gammage Years. In 1933, Grady Gammage, then president of Arizona State Teachers College at Flagstaff, became president of Arizona State Teachers College at Tempe, a tenure that would last for nearly 28 years.

The Graduate Division was created in 1937, and the first master's program was established the same year.

On March 8, 1945, the three state institutions of higher learning came under the authority of one Arizona Board of Regents, which oversees ASU today.

The phenomenal growth of the college began after the end of World War II. Dr. Gammage had foreseen that the G.I. Bill of Rights would flood campuses everywhere with returning veterans. Many of the veterans who had received military training in Arizona had fallen in love with the state and vowed to return after the war. The numbers within one year were staggering: in the fall semester of 1945, 553 students were enrolled; over the weekend semester break in January 1946, enrollment increased 110 percent to 1,163 students. Successive semesters saw continuing increased enrollment.

Like his predecessor, Dr. Gammage oversaw the construction of a number of buildings. His greatest dream, that of a great auditorium, came to fruition after his death. He laid the groundwork for it with Frank Lloyd Wright, who

designed what is now the university's hallmark building, Grady Gammage Memorial Auditorium, built in 1964.

Years of Growth and Stature. During the 1960s, with the presidency of Dr. G. Homer Durham, Arizona State University began its academic rise with the establishment of several new colleges (the College of Fine Arts, the College of Law, the College of Nursing, and the School of Social Work) and the reorganization of what became the College of Liberal Arts and Sciences and the College of Engineering and Applied Sciences. Perhaps most important, the university gained the authority to award the Doctor of Philosophy and other doctoral degrees.

The next three presidents—Harry K. Newburn, 1969–71, John W. Schwada, 1971–81, and J. Russell Nelson, 1981–89—and Interim President Richard Peck, 1989, led the university to increased academic stature, expansion of the campuses, and rising enrollment.

On January 1, 1990, Dr. Lattie F. Coor, a native Arizonan, became 15th in the institution's succession of principals and presidents. He has highlighted undergraduate education, research, cultural diversity, and economic development as the "four pillars" of the university's agenda. He has taken steps in these areas by further defining the role of ASU West and by initiating the establishment of ASU East.

In 1996, "The University for the Next Century" initiative, involving campus and community members, developed a set of general goals to guide the university at the turn of the millennium. By making selective investments in people, programs, and new practices, ASU will be a prototype of the major metropolitan research university of the future.

In 1997, President Coor publicly launched the ASU Campaign for Leadership, a \$400 million fund-raising campaign designed to transform ASU into *the* model metropolitan research university for the 21st century. Funds raised through the campaign, which continues through 2001, are targeted to the areas that will most significantly impact the future of ASU: Great Teachers, Great Students, and Great Communities. Among the campaign's achievements thus far are the naming and endowing of the Barrett Honors College, the Herberger College of Fine Arts, and the Morrison School of Agribusiness and Resource Management at ASU East; the creation of many new endowed faculty positions and hundreds of new scholarships and fellowships; and the enhancement of programs and facilities across the university.

As of fall 2000, ASU was the fourth largest university in the nation with approximately 50,000 students.

Research Extensive Status. ASU was named a Research I (now referred to as Research Extensive) university by the Carnegie Foundation for the Advancement of Teaching in early 1994. Nationally, 88 universities have been granted this status, indicating successful garnering of support for research projects and educating future scientists.

Athletics

The original nickname for the Normal School of Arizona athletic teams was the Owls. Athletics other than Sunday hikes and lawn tennis were not part of the early curriculum.

During President Matthews' tenure, some team competition began. The Tempe Bulldogs saw some interesting and rough competition with the University of Arizona Wildcats. In the 1940s, the college's teams became the Sun Devils.

In 1979, the university joined the Pacific-10 Conference. In 1987, ASU became the first Arizona football team to play in the Rose Bowl, defeating the University of Michigan Wolverines 22-15. ASU made its second appearance in 1997 against Ohio State.

In 2000, ASU finished 11th nationally in the Sears Directors' Cup, which recognizes the top athletic programs in the country. Six teams finished in the top 20 nationally with three teams posting top 10 finishes. Men's swimming and diving finished 10th, women's tennis finished in a tie for fifth, while men's indoor track and field also finished 10th.

UNIVERSITY CAMPUSES AND SITES

ASU Main. ASU Main is located near the heart of metropolitan Phoenix in the city of Tempe (population 163,626). Nearby are the municipalities that make up the fast-growing Valley of the Sun: Chandler, Gilbert, Glendale, Mesa, Scottsdale, and other communities.

ASU Main comprises more than 700 acres and offers outstanding physical facilities to support the university's educational programs.

The campus is characterized by broad pedestrian malls laid out in an easy-to-follow grid plan, spacious lawns, and subtropical landscaping. ASU Main offers more than 80 programs leading to bachelor's degrees and more than 140 programs leading to graduate degrees.

ASU East. ASU East opened at the Williams Campus in the fall of 1996 and now serves approximately 2,000 students. ASU East offers many of the features of a small residential college in a rural area while providing access to the resources of a major research university and the amenities of a large metropolitan area.

ASU East has joined with Chandler-Gilbert Community College in the Partnership in Baccalaureate Education that allows students to graduate in four years with an ASU baccalaureate degree earned entirely at the Williams Campus, at some savings in tuition.

The campus offers excellent educational facilities and residential opportunities, which include a choice of traditional residence halls or two- to five-bedroom homes. A shuttle service provides transportation between ASU East and ASU Main. The 600-acre ASU East campus is easily accessible via major interstate routes.

For more information, see "ASU East," page 603.

ASU West. ASU West is a growing anchor campus of Arizona State University that offers primarily upper-division undergraduate and graduate degree programs, plus certificates, in diverse professional fields. Starting in fall 2001, the campus admits freshmen for the first time since its founding in 1984.

As a commuter campus, ASU West offers an array of innovative student services to help working families achieve their educational goals: A child development center, academic advising, and writing support services are just a few examples.

At ASU West, students enjoy a friendly, small-campus atmosphere while benefiting from the resources of a major research university.

The campus is located in northwest Phoenix between 43rd and 51st Avenues on West Thunderbird Road. The core campus was completed in 1991 and features a variety of state-of-the-art classroom and student service buildings,

including Fletcher Library, the Sands Classroom Building, the Computer Laboratory/Classroom Building), Kiva Lecture Hall, the University Center Building, and the Faculty/Administration Building.

For more information, see "ASU West," page 668. For complete information and course listings, see the *ASU West Catalog*.

ASU Extended Campus. The ASU Extended Campus (www.asu.edu/xed) goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies, including television, the Internet, and independent learning. The ASU Extended Campus offers programs in partnership with the campuses and colleges of ASU, including a variety of professional continuing education programs. The ASU Downtown Center is the anchor location of the ASU Extended Campus. Lifelong learning opportunities are offered to students of all ages throughout Maricopa County and Arizona through the ASU Extended Campus.

ASU Downtown Center. Located in downtown Phoenix, 502 E. Monroe, the ASU Downtown Center offers a variety of daytime and evening courses of interest to employees in private businesses and government agencies and to individuals seeking personal growth and enrichment. These courses are scheduled at a variety of convenient times and offered through various modes of delivery. Professional continuing education, certificate programs, and lecture series are also available. Access to ASU library information and resources, ASU computing resources, and the Internet is available through the center's computer lab.

ASU Research Park. The mission of the ASU Research Park (researchpark.asu.edu) is to enhance Arizona's high-value research-based economic development and to build the university's capacity to educate and advance knowledge. To this end, the Research Park serves to attract new corporate and regional headquarters and research and development firms to Arizona—headquarters and firms that broaden the base for potential research, interact with graduate students, consult with university faculty, cosponsor seminars on research topics, and provide employment opportunities for ASU graduates.

The Research Park has numerous major tenants, including ASM Lithography, Avnet CMG, Bright Horizons Family Solutions, Cytec Fiberite, Iridium, Lakeside Technology Center, Motorola Flat Panel Display, Motorola University, National Association for Purchasing Management, PKS Information Services, Transamerica Research Center, VLSI Technology, and Walgreens Healthcare Plus. A 50,000-square-foot multitenant building has been developed by Transamerica Corporation, and the Lakeside Technology Center, a 44,000-square-foot multitenant building, has been developed by the park itself.

Camp Tontozona. Located in the famed Mogollon Rim country near Kohl's Ranch, northeast of Payson, this continuing education facility serves the needs of academic departments conducting teaching and research in mountain terrain. The camp is also available to faculty, staff, graduate

students, and alumni for family use. For more information, call 480/965-6851.

Deer Valley Rock Art Center. Deer Valley Rock Art Center, located two miles west of the Black Canyon Freeway on Deer Valley Road, is operated by the ASU Department of Anthropology in consultation with the Hopi, Yavapai, and Gila River Indian tribes. It includes more than 1,500 petroglyphs that cover the eastern slope of Hedgpeth Hills. For more information, call 623/582-8007.

The Arboretum. The Arboretum at Arizona State University is the entire 722-acre main campus. The Arboretum is home to a flourishing oasis of plants from around the world. This virtual outdoor classroom includes more than 300 species of trees and other woody ornamental and herbaceous plants from diverse geographic regions as well as the Sonoran Desert. The Arboretum contains one of the best collections of palms and conifers in the desert Southwest and a growing collection of native Southwestern plants. The Arboretum's date palm collection has received international recognition by the American Association of Botanical Gardens and Arboreta North American Plant Collection Consortium.

The Arboretum's collection began with Arthur J. Matthews. By the time Matthews' 30-year presidency was finished, nearly 1,500 trees of 57 species and more than 5,700 feet of hedges were planted. One of his most enduring landscape projects was the planting of Mexican Fan Palms along Palm Walk in 1916, which extends from University Drive south to the Student Recreation Complex. Today the Arboretum has expanded its collection to include nearly 4,000 trees of 164 species/varieties.

The Arboretum is open to the public free of charge 365 days a year from dawn to dusk. Walking tours of the various collections and points of interest are designated by signage denoting those areas. Many of the plants in the collection throughout campus are marked with identification plaques.

UNIVERSITY LIBRARIES AND COLLECTIONS

The collections of the university's libraries comprise more than 3 million volumes, approximately 7 million microform units, and more than 33,000 periodical and serial subscriptions. Computer access to commercially and locally produced databases and the ability to borrow research materials from other libraries enhance local resources. ASU is a member of the Association of Research Libraries and the Center for Research Libraries.

For telephone numbers, see the "ASU Main Directory," page 522. For more information, access the Web site at www.asu.edu/lib.

Charles Trumbull Hayden Library. The Charles Trumbull Hayden Library, designed by Weaver and Drover in 1966, houses the largest multidisciplinary collection at ASU. In addition to the open stack areas, separate collections and service areas include Access for Disability Accommodations; Circulation; Current Periodicals and Microforms; Government Documents Services; Interlibrary Loan and Document Delivery Services; Library Instruction, Systems, and Technology (L.I.S.T.); Reference; Reserve; Special Collections; and Archives and Manuscripts, which includes the Arizona Collection, the Chicano Research Collection, the Benedict Visual Literacy Collection, and the Labriola

National American Indian Data Center. Archives and Manuscripts holds the papers of several major Arizona political figures, including Senator Carl Hayden, with historic materials about Arizona, Chicano, and Indian affairs.

The Special Collections department includes the Child Drama Collection, and collections of materials by and about William S. Burroughs, the Press of Thomas Bird Mosher, and the Patten Herbal Collection. For more information, access the Web site at www.asu.edu/lib/hayden.

Architecture and Environmental Design Library. A branch of the University Libraries, located in the College of Architecture and Environmental Design/North building, contains collections pertinent to areas of study within the college, the Materials Resource Center, and the Architectural Drawings Collection. For more information, access the Web site at www.asu.edu/caed/AEDlibrary.

Arizona Historical Foundation. Under a cooperative agreement with ASU, the Arizona Historical Foundation houses a library of several thousand volumes, manuscript collections, maps, and photographs, and a large collection of audiovisual materials. Housed in the Charles Trumbull Hayden Library, the collection's focus is on the history of Arizona and the Southwest. For more information, access the Web site at www.asu.edu/lib/ahf.

Fletcher Library. Located at the ASU West campus, Fletcher Library utilizes a range of electronic systems, from compact discs to telecommunications networks, to provide access to resources and delivery of materials. Its holdings include more than 315,000 volumes, 5,000 serial subscriptions, and 1.4 million microforms selected to complement ASU West course offerings.

Law Library. The John J. Ross–William C. Blakley Law Library is located on McAllister Avenue. See “Law Building and Law Library,” page 312, for more information.

Music Library. A large collection of music scores, recordings, books, music reference materials, and listening facilities for individuals and groups is located on the third floor of the Music Building, West Wing. For more information, access the Web site at www.asu.edu/lib/music.

Daniel E. Noble Science and Engineering Library. The Daniel E. Noble Science and Engineering Library houses books, journals, and microforms in the sciences, engineering, and nursing; the Map Collection; and the U.S. Patent and Trademark Depository. For more information, access the Web site at www.asu.edu/lib/noble.

University Archives. The University Archives collection is available for use at the Luhrs Reading Room in Hayden Library. The collection (1885–present) comprises university theses and dissertations; administrative records of the university; historical photographs and personal papers of faculty, staff, and alumni; and student, faculty, and official university publications. The historic University Archives Building on Tyler Mall is the home of the 1907 Gallery, which hosts exhibits of historical photographs from the collections of the Department of Archives and Manuscripts. For more information, access the Web site at www.asu.edu/lib/archives/archives.htm.

Video Resources. Located in ECA 100, Video Resources supports a variety of educational media services, including reserve videotapes of all ASU courses broadcast on cable television and ITFS, video viewing/study carrels, and a studio facility for students and faculty. In addition, Video Resources houses thousands of video titles in the ASU Media circulating collection that may be checked out for three days. Special Collections include the WorldFest Video Archive, Horizon, C-SPAN Booknotes, and C-SPAN I and II. Patrons with a current university ID may check out any available videotape for three days. Interlibrary loans and video booking may be scheduled by calling 480/965-7564. For more information, call 480/965-5046, or access the Web site at www.asu.edu/lib/video.

PERFORMING AND FINE ARTS FACILITIES

ASU Art Museum. The ASU Art Museum serves students and scholars within and beyond the university and as a cultural resource for the Phoenix Metropolitan area. Additionally, the museum serves a public beyond the immediate area through traveling exhibitions and publications that not only document the exhibitions but also offer critical insight into the museum's areas of concentration.

Exhibitions, education programs, and publications are interdisciplinary and educational and are designed to engage viewers with art that is relevant to their lives. New technologies in the content of art and in the approaches to reaching new audiences are eagerly and openly adopted.

Collections and exhibitions focus on contemporary art, particularly new media and new methods of presentation; art by Latin American artists; art from the Southwest; prints, both historic and contemporary; and crafts, emphasizing American ceramics. The museum was founded by a gift of historic American paintings, which are on continuous display, including works by Gilbert Stuart, Albert Pinkham Ryder, Winslow Homer, Georgia O'Keeffe, and Romare Bearden. The contemporary art holdings include works by Nam June Paik, Lorna Simpson, Vernon Fisher, Sue Coe, and Enrique Chagoya. Exhibitions and collections are housed in galleries and study rooms in two facilities: the international award-winning Nelson Fine Arts Center and Matthews Center in the middle of campus.

Educational programs include artist residencies and dialogs with classes, a student docent program, internships and research assistanceships, lectures and symposia, in-gallery materials, special curricula-based school programs, and school and public tours. For information on upcoming exhibitions and programs, call 480/965-2787.

ASU Downtown Center Gallery and the Galleria. The Gallery, located on the first floor of the ASU Downtown Center, is a partnership with the Joint Urban Design Program from the College of Architecture and Environmental Design. The Gallery features special rotating exhibits, including architectural models, computer imaging projects, and other unique exhibits accessible for public view. For information on upcoming exhibitions and programs, call 480/965-3046.

The Galleria, located on the second floor of the ASU Downtown Center, features work by ASU faculty, staff, students, and local artists. The Galleria is a member of Artlink First Friday's and the Phoenix Art Detour. Open Monday through Saturday, from 8 A.M. to 5 P.M., the Galleria features

new and different works each month. For information on current or upcoming exhibitions, call 480/965-3046.

Computing Commons Gallery. One of the few exhibit spaces of its kind, the Computing Commons Gallery features five to six changing exhibits per year: technology-generated art, multimedia installations, and history of technology. For a current gallery schedule, access the Web site at www.asu.edu/it/spotlight.

Dance Multimedia Learning Center. The Department of Dance Multimedia Learning Center is a facility designed to promote and encourage the use of media and computer technology in dance education and performance at ASU.

Dance Studio Theatre. The Dance Studio Theatre is a 300-seat performance space that is the mainstage performance site for the 12 formal and informal concerts produced annually by the Department of Dance. The theatre is one of the only dance spaces in the country that is designed with interactive and telematic capabilities. The facility uses video-based motion sensing and enables dancers to interact with sound, lighting, images, and video in performance. High-speed Internet connectivity enables this space to connect with other telematic spaces for dual, multisite and Web performances.

Drama City. Housed in a 50-year-old former church, Drama City is the primary performance venue for the Institute for Studies in the Arts. The space is a black box, 60 by 30 feet with fixed lighting positions and flexible control stations. The area can seat up to 100 and is equipped for performance or installation pieces. The facility also houses a wide range of technology for performance and presentation including video projection, automated luminaires, and a unique computerized control system for integrated media usage.

Gallery of Design. Housed in the College of Architecture and Environmental Design, the Gallery of Design features traveling exhibitions on design and urban issues.

Paul V. Galvin Playhouse. Built to stage the largest productions of the ASU Theatre, the Paul V. Galvin Playhouse is a 496-seat proscenium-stage theatre set at the east end of the Nelson Fine Arts Center. The Department of Theatre's annual season of 12 to 15 plays also includes productions in the Lyceum and Prism theatres and the Nelson Fine Arts Center Studios.

Grady Gammage Memorial Auditorium. A versatile center for the performing arts designed by Frank Lloyd Wright and named for the late ASU President Grady Gammage, Grady Gammage Memorial Auditorium seats 3,000 and has won wide acclaim for its design and acoustics. In addition to the great hall and related facilities—including the Aeolian-Skinner organ contributed by Hugh W. and Barbara V. Long—the building contains classrooms and workshops for the Herberger College of Fine Arts.

The Intelligent Stage. The Intelligent Stage is a production and performance facility designed to explore the possibilities of interactive stage performance. The facility includes a sprung floor; 30 dimmers and a four channel sound system; a composer workstation; workstations for designing interactive MIDI performances; and a movement sensing, image-

processing workstation. All are networked together for multimachine performance and production. Resident artists and technologists provide design and logistical support for projects in the facility.

Katzin Concert Hall. Located in the new music building expansion, the Katzin Concert Hall seats 350 people. Primarily used for solo and chamber music recitals, the hall houses a nine-foot Hamburg concert Steinway piano. The acoustics are enhanced by the maple-paneled stage and the multifaceted walls and ceiling.

Louise Lincoln Kerr Cultural Center. Located in Scottsdale, the Louise Lincoln Kerr Cultural Center offers cultural events, especially in the performing arts, to the community.

Lyceum Theatre. A small but technically sophisticated 164-seat proscenium theatre, the Lyceum Theatre is a venue for faculty productions and a laboratory for the work of student playwrights, directors, and actors.

Music Theatre. As part of the music complex, the Music Theatre, modeled after the Wagnerian Theatre in Bayreuth, Germany, rises five stories and seats an audience of 500. This theatre is the home of many operatic and musical productions.

J. Russell and Bonita Nelson Fine Arts Center. Designed by Albuquerque architect Antoine Predock, the J. Russell and Bonita Nelson Fine Arts Center is a spectacular, 119,000-square-foot, village-like aggregate of buildings that includes five galleries of the ASU Art Museum, the Paul V. Galvin Playhouse, the University Dance Laboratory, seven specialized theatre and dance studios, a video studio, and a variety of scenic outdoor features, including courtyards, fountains, pools, and a 50-by-100-foot projection wall designed for outdoor video.

Northlight Gallery. The Northlight Gallery is dedicated to museum-quality exhibitions of historical and contemporary photography. Located in Matthews Hall, it is open during the academic year.

Organ Hall. Located in the new music building expansion, the Organ Hall houses the Fritts Organ. This tracker-action pipe organ is designed to capture the qualities of baroque European organs. The hall is designed to complement the organ with a barrel-vaulted ceiling and wooden benches to seat 175 persons.

Prism Theatre. The Prism Theatre is an alternative black box space devoted to multiethnic, experimental works and student productions.

Recital Hall. Located on the fifth floor of the Music Building, the Recital Hall is an intimate 125-seat facility that opens onto a rooftop courtyard.

Sundome Center for the Performing Arts. As America's largest single-level theatre, the Sundome Center for the Performing Arts in Sun City West has 7,169 seats. The theatre is equipped with sophisticated, state-of-the-art lighting systems, and a single-span roof affords each seat a clear view. As one of Arizona's premier entertainment venues, the Sundome provides an array of top entertainment from Las Vegas-style concerts to classical ballets to celebrity lectures.

Television Station KAET. KAET, Channel 8, is the university's PBS station. Studios of the award-winning station are located in the Stauffer Communication Arts Building. To operate 24 hours a day, KAET employs more than 50 ASU students and interns. To learn more about KAET-TV, access its Web site at www.kaet.asu.edu, or call 480/965-3506.

University Dance Laboratory. A flexible performance space within the Nelson Fine Arts Center, the University Dance Laboratory is designed specifically for experimental dance productions. Along with the Dance Studio Theatre in the Physical Education Building East, the University Dance Laboratory is used by the Department of Dance for experimental performances.

Harry Wood Gallery. Housed in the Art Building (ART 120), the Harry Wood Gallery provides temporary exhibitions of the visual arts during the academic year.

COMPUTING FACILITIES AND SERVICES

Computers are fundamental tools for learning, instruction, and research in every college and department at ASU. The Information Technology (IT) department provides a variety of computing equipment and services available for use by students, faculty, and staff. IT also provides programming, statistical, graphics, and other applications for desktop computers and mainframe computing systems. University-wide electronic mail and the library's online catalog are accessible through a high-speed campus network and from off campus via the Internet.

A wide range of information on campus activities and related topics is available online at the ASU Web site www.asu.edu. This site contains a wide variety of information from various colleges, departments, and organizations, including approved courses, the *Schedule of Classes*, the *General Catalog*, the *Graduate Catalog*, a telephone and electronic mail directory, the athletic calendar of events, application forms, and financial aid information.

IT provides several service centers, described below, for the ASU academic community.

Computing Commons. The Computing Commons building (CPCOM) provides a "technology hub" that draws together students, faculty, and staff from all disciplines on campus in an environment conducive to maximum creative interaction. The building and its facilities have drawn national recognition and acclaim as a model for the support of instruction and research in a technology-based environment. The Computing Commons houses a 225-workstation computing site, nine electronic classrooms, a Research Support Lab, the Customer Assistance Center, a computer store, and a technology-based gallery (see "Computing Commons Gallery," page 25).

Computing Sites. In addition to the Computing Commons Atrium, there are three additional computing sites located on the ASU Main campus, available for ASU faculty, staff, and students. Site configurations and hours of operation vary; current information is available on the Web at www.asu.edu/computingsites.

ASU Downtown Center Computer Lab. The ASU Downtown Center offers an alternative to the computer labs at ASU Main. This facility features four Pentium II-400 Mhz and 16 Pentium-200 Mhz computers—all loaded with

Microsoft Office 2000, Internet Explorer, Netscape, and other software. A high-speed laser printer and a color flat-bed scanner are available, and faculty may use the ceiling-mounted computer projection system. The ASU Downtown Center is located in downtown Phoenix. It is a unique educational, applied-research, and community-service facility designed to address the multifaceted urban opportunities of the central Phoenix community. For more information, call 480/965-3046, or access the Web site at www.asu.edu/xed/dtceplab.

Computer Accounts. Computer Accounts, located in CPCOM 105, assists customers with account access issues (including lost passwords), disk space quotas, accounts for non-ASURITE services (including mainframe computer access), and other account-related services. Most computing services are accessible through the standard ASURITE UserID and password, available from self-subscription workstations located in a variety of on-campus locations or online (accessible from ASU addresses only) at www.asu.edu/selfsub. More information about Computer Accounts is available on the Web at www.asu.edu/computereaccounts.

Customer Assistance Center. The Customer Assistance Center, located in CPCOM 202, offers a library of reference manuals, computing periodicals, and other information concerning computing systems and software. Self-paced training is available for various software applications running under the Windows, Macintosh, or Unix operating systems. The center also distributes communication, virus protection, and other site-licensed software as well as site-specific documentation in a "print-on-demand" format. Print on demand is also available on the Web at www.asu.edu/quicklook. More information about the center is available from the Web site at www.asu.edu/cacenter.

Help Desk/Consulting. The IT Help Desk provides ASU students, faculty, and staff with centralized systems information and first-level assistance in resolving computing problems. Services are available by telephone at 480/965-6500, on the Web at www.asu.edu/helpdesk, and in person at the Customer Assistance Center, CPCOM 202. The IT Help Desk assists with data recovery and repair; AFS filespace and permissions for Web sites; communication, e-mail, and virus protection software; and computing and equipment problem referral.

Instruction Support (IS). Instruction Support serves as a development center for the use of technology in the design and delivery of instruction. Staffed with students, faculty, and researchers skilled in the areas of system design, graphics, interactive software, networked delivery, and digital video, the innovation-driven group pushes the development of instruction to the limits of available technology. From this perspective, IT/IS fosters technological innovation by serving as a research and development unit, a production group, and a training facility.

IT/IS collaborates with faculty in the coordination of cross-disciplinary research and production projects relating to the integration of technology with education. Through partnerships with faculty and groups outside ASU, grant-writing teams are able to leverage support not otherwise available to a single academic unit or faculty member. Cen-

tral to effective support services is the establishment of a partnership among the various support units within the university. IT/IS coordinates the efforts of these groups—which include the College of Extended Education, University Libraries, Disability Resources for Students, and the Office of Research and Creative Activities—to provide faculty with a wide array of instruction support services.

IT/IS offers consultation sessions tailored toward enhancing the instructional use of technology by the university teaching community. Sessions range from an introduction to technology in education through advanced and customized approaches for instructors in specific programs.

More information about IT/IS is available from the Web site at is.asu.edu.

Instruction Support (IS) Lab. The IS Lab provides an environment in which faculty may seek and receive one-on-one, guided, or independent support for course development and delivery. Expert staff work closely with faculty to refine and develop their skills and confidence in the design and delivery of instruction through a variety of technology-supported means, both synchronous and asynchronous. Located in CPCOM 213, the IS Lab provides faculty, university professionals, and graduate students with a unique opportunity to integrate technology with instruction. The IS Lab sponsors workshops and demonstrations and serves as a dynamic clearinghouse of information and referrals for effective integration of technology with education.

Research Support (RS). Research Support provides processing and operations assistance to faculty, staff, and student researchers engaged in scientific and creative endeavors. Processing support involves consulting in the use of software tools and program coding directly related to projects or specific research; operations activities support the overall workflow in university computing facilities and include consulting for computation, statistics, visualization, and GIS platforms in conjunction with software package installation and use; media conversion; and product evaluation.

A variety of computation facilities are provided in support of research and creative endeavors within the ASU community, ranging from individual workstations to SMP/MPP servers and mainframes. Extended computer capabilities are available through access to national computing centers. More information is available at www.asu.edu/it/fyi/research on the Web.

Research Support (RS) Lab. The RS Lab is located in CPCOM 235 and provides Geographic Information Systems (GIS) Services and Visualization Services. GIS services staff members provide researchers with hardware, software, and data to facilitate the creation of geographic information systems for spatial analysis, query, and display. Research is supported from various disciplines and provides additional resources to students enrolled in classes for GIS instruction, serving as a focal point for GIS users to meet and share information and technical expertise.

Visualization Services offers faculty, staff, and graduate students the hardware and application software resources and services for the high-level graphics and visualization used in research. Researchers receive assistance ranging from interactive viewing of scientific data to visualization in the liberal and the performing arts and other endeavors.

ALUMNI ASSOCIATION

Founded in 1894, the Alumni Association is a volunteer-led organization committed to serve and unite alumni for the purpose of advancing the interests of ASU and its alumni. The association provides a variety of services for ASU alumni as well as a series of events scheduled around the country.

With more than 230,000 alumni living in the United States and throughout the world, the association plays an important role as the university's primary support organization. Comprising more than 50 groups, the campus, college, club, and chapter organizations (4Cs) of the association provide opportunities for all alumni to stay involved with the part of ASU that interests them most.

Members of the ASU Alumni Association Board of Directors are elected each spring. See "Institutional Advancement," page 600. For more information about the association or its board of directors, call 1-800-ALUMNUS or 480/965-ALUM.

PROGRAM ASSESSMENT AND THE OFFICE OF UNIVERSITY EVALUATION

The Office of University Evaluation is a research and service facility that focuses on assessing and improving the effectiveness of the university's academic and support programs. The office conducts, coordinates, and manages research designed to measure the degree to which courses, curricula, and academic programs impart knowledge and skills to students as well as the quality of support provided to students. The results of these studies, or assessments, are used to enhance both the support provided to students and the intellectual integrity of an ASU education.

In order for the university to assess and improve its programs, periodic measurement of student experiences, perceptions, and intellectual growth must be obtained. When asked by the university, students are expected to participate in one or more evaluative procedures, such as the ASU Report Card. These evaluative procedures are designed to assess the efficacy of the total university experience, including teaching and learning and support programs and are not used in individual grading. The information obtained is one of the means used to improve the quality of the educational experience for this and future generations of ASU students.

For more information, call the office at 480/965-9291, or contact them via e-mail at oue@asu.edu. The Office of University Evaluation's Web site is www.asu.edu/oue.

RESEARCH CENTERS, INSTITUTES, AND LABORATORIES

These units serve the university's mission in research. They are overseen by eight of the colleges, the vice provost for Research, and the ASU East provost.

Center for Research on Education in Science, Mathematics, Engineering, and Technology. The Center for Research on Education in Science, Mathematics, Engineering, and Technology (CRESMET), an alliance of the ASU Colleges of Education, Engineering and Applied Sciences, and Liberal Arts and Sciences, was initiated in 1999, growing out of what was previously the Center for Innovation in Engineering Education. The mission of the center is to bring together individuals, programs, and organizations interested in improving K–20 science, mathematics, engineering, and

technology education to research, develop, and assess educational theories, curricula, courses, and administrative policies that impact science, mathematics, engineering, and technology education. The center also encourages and supports wide-scale sharing and implementation of effective approaches to producing a more scientifically and technologically literate populace and more capable science, mathematics, engineering, and technology majors.

Research. CRESMET pursues research and development that demonstrates coherent, consistent, and conceptual powerful mathematics, science, engineering, and technology education from kindergarten through college (K–20).

Partnering. CRESMET supports collaborations across the traditional boundaries of university, community, business, and local education agencies.

Sharing. CRESMET establishes communication avenues for intellectual and material products proven effective in supporting powerful learning in science, mathematics, engineering, and technology fields.

For more information, visit CRESMET in ECG 303, call 480/965-5350, or access the CRESMET Web site at www.eas.asu.edu/~cresmet.

College of Architecture and Environmental Design

Herberger Center for Design Excellence. The Herberger Center for Design Excellence is the research, outreach, and publication arm of the College of Architecture and Environmental Design. The center facilitates and promotes research, scholarship, and creative activity among the faculty and students of the college in the fields of architecture, interior design, industrial design, graphic design landscape architecture and urban design, and environmental planning.

In keeping with its outreach mission, the Herberger Center also publishes reports, newsletters, and books that help to inform debate on key design and planning issues in the desert southwest. The center works closely with the faculty to publish books, working papers, and conference proceedings that promote scholarship in the planning and design disciplines.

The Joint Urban Design Program (JUDP), based in downtown Phoenix, is the center's outreach arm. It facilitates interaction among college faculty, students, and the broader community, and offers design as a way to further dialogue and to address urban issues. The JUDP conducts intensive workshops, (community-based charrettes) that help neighborhoods, groups, and other city stakeholders focus on concerns and strategies to respond to critical needs. Student groups and faculty work with the JUDP to identify real world problems that they address in studio projects. For more information, call 480/727-5146, or access the JUDP Web site at www.asu.edu/caed.

College of Business

Arizona Real Estate Center. The Arizona Real Estate Center (AREC), established in 1980, serves a multifunction research and educational role to foster better understanding of the real estate sector of the Arizona economy. Housing, commercial real estate, and construction activity data for Arizona and Maricopa County are collected by the center and are utilized for a variety of ongoing projects, including the calculation of affordability indexes and the computation of housing appreciation figures for the metropolitan Phoe-

nix area. The center's annual outlook series provides a public forum for prominent members of the real estate industry to present their perceptions of market conditions.

For more information, call 480/965-5440, access the AREC Web site at www.cob.asu.edu/seid/arec, or write

ARIZONA REAL ESTATE CENTER
PO BOX 874011
TEMPE AZ 85287-4011

Bank One Economic Outlook Center. The Bank One Economic Outlook Center (EOC), established in 1985, specializes in economic forecasts of Arizona and the Western states. The center publishes the *Bank One Arizona Blue Chip Economic Forecast* (monthly), *Greater Phoenix Blue Chip Economic Forecast* (quarterly), *Western Blue Chip Economic Forecast* (10 issues per year), and *Blue Chip Job Growth Update* (monthly), an update of current job growth in the United States. The center also publishes *Mexico Consensus Economic Forecast* (quarterly), a forecast and historical data on the Mexican economy.

For more information, call 480/965-5543, access the EOC Web site at www.cob.asu.edu/seid/eoc, or write

BANK ONE ECONOMIC OUTLOOK CENTER
PO BOX 874011
TEMPE AZ 85287-4011

Center for the Advancement of Small Business. The Center for the Advancement of Small Business (CASB) is the 21st-century leader in business education, practice, and research that provides high-quality, relevant programs, and information services focused on small business since 1994. The center enables students and existing small and medium-size businesses to participate, contribute, and compete in the global economy.

The center provides students from all disciplines with programs and resources that prepare them for positions of leadership in small and medium-size businesses, and aids small and medium-size businesses in the continuous improvement of their human resources and business practices. CASB also engages in applied research on entrepreneurship and the emerging changes and trends in small business.

For more information, visit CASB in BAC 111, call 480/965-3962, or access the CASB Web site at www.cob.asu.edu/seid/casb.

Center for Advanced Purchasing Studies. The Center for Advanced Purchasing Studies (CAPS) was established in November 1986 by a national affiliation agreement between the ASU College of Business and the National Association of Purchasing Management. It is the first and only program of its kind in the nation and is located in the Arizona State University Research Park, about eight miles south of the main ASU campus. CAPS conducts in-depth research into the problems facing the purchasing profession today and, through its studies, seeks to improve purchasing effectiveness and efficiency and the overall state of purchasing readiness.

For more information, call 480/752-2277, or write

CENTER FOR ADVANCED PURCHASING
STUDIES
ASU RESEARCH PARK
2055 E CENTENNIAL CIRCLE
PO BOX 22160
TEMPE AZ 85285-2160

Center for Business Research. The Center for Business Research (CBR) has been a consistent source of information on the Arizona and metropolitan Phoenix economies since 1951. Both the business community and the public have had access to the economic indicators produced by the ongoing projects of the center, including quarterly net migration estimates for Arizona and Maricopa County. CBR also conducts projects under the sponsorship of private and public agencies. Recent examples include the economic impact of Super Bowl XXX, a study of seasonal migration to Arizona, and an analysis of the state's hospital industry. A monthly publication of the center, *AZB/Arizona Business*, plays a major role in disseminating to the public the economic information compiled by the research centers of the Seidman Institute. The staff within the center is available to respond to inquiries and to provide available data.

For more information, call 480/965-3961, access the CBR Web site at www.cob.asu.edu/seid/cbr, or write

CENTER FOR BUSINESS RESEARCH
PO BOX 874011
TEMPE AZ 85287-4011

Center for Services Marketing and Management. The Center for Services Marketing and Management (SMM Center) is a leading university-based hub devoted to the study of services marketing and management since 1985. The SMM Center addresses how any company can improve internal service processes and use service and customer satisfaction as a competitive advantage. The center encourages firms to share the best ideas and practices for adaptation across industries. Though grounded in marketing, the center's work is cross-functional, integrating concepts and techniques from marketing, operations, human resources, and management.

The center's areas of expertise include customer retention and loyalty; service quality; service delivery; professional services such as healthcare, accounting, and consulting; customer satisfaction; services strategy; service culture; and service recovery. A leader in the business and academic communities, the SMM Center's work advances the knowledge base in the field and provides applicable frameworks, concepts, and tools.

The center offers its partner firms topflight executive education in services through the annual "Activating Your Firm's Service Culture" symposium, the annual "Services Marketing and Management" institute program, and the annual "Information Technology Services Marketing" course and provides customized executive education programs and research projects tailored to and conducted for charter member firms.

The center also actively supports the College of Business M.B.A. program that offers a certification in Services Marketing and Management. The services track infuses strong company-based experience and encourages summer internships.

For more information, visit the SMM center in BAC 440, or call 480/965-6201.

Center for the Study of Finance. The Center for the Study of Finance, established in 1986, serves the national financial, policy-making, and academic communities through research, publications, conferences, and educational programs. The focus of such activities is on the changing nature of the domestic and international financial system with such specific areas as the interaction between financial markets, deposit insurance reform, the deregulation of financial institutions, the financing of mergers and acquisitions, and the effect of government policy on financial markets receiving recent attention.

For more information, call 480/965-5362, or write

CENTER FOR THE STUDY OF FINANCE
PO BOX 874011
TEMPE AZ 85287-4011

L. William Seidman Research Institute. The mission of the L. William Seidman Research Institute is to encourage and support applied business research by serving as a public access point to the College of Business. Specific goals include transferring new knowledge to the public; supporting faculty and student research; encouraging the development of educational programs grounded in business research; and conducting high-quality, applied business research.

The institute encourages research activity by providing research support services to the faculty, staff, and students of the college. These services include facilitating grant preparation and assistance in grant administration. The institute's research centers act as the focal point for involving faculty and students in applied research on important issues identified by the business community.

The institute also serves an important role in the broader educational mission of the College of Business by disseminating the findings of research conducted by the faculty, students, and research center staff, as well as the results of business research from other sources around the world. This is accomplished through a variety of mechanisms: newsletters and research reports; seminars and conferences; internet Web pages; media interviews and press releases; and by responding to inquiries from businesses, public officials, and the community. For more information, call 480/965-5362, access the institute's Web site at www.cob.asu.edu/seid, or write

L. WILLIAM SEIDMAN RESEARCH INSTITUTE
PO BOX 874011
TEMPE AZ 85287-4011

Manufacturing Institute. See "Manufacturing Institute," page 30, for information about this joint venture of the College of Business and the College of Engineering and Applied Sciences.

College of Education

Center for Bilingual Education and Research. The Center for Bilingual Education and Research (CBER) was created in 1980 to conduct policy-relevant research in bilingualism, bilingual education, and language policy in education. The center's scope of work is driven by a need to merge several related topics into a single articulated

conversation: English/Spanish biliteracy; promoting the role of public education to strengthen communities; and enabling binational collaboration among educators on both sides of the U.S.-Mexico border. The long-term vision is to help develop a new pedagogy tailored to the needs of the bicultural region the center serves. The integration of these themes shapes the scope of work for CBER in these areas:

1. Within the broad scope of educational policy research, CBER focuses on scholarly inquiry that contributes to informed and enlightened discourse on language policy for schools and society, especially on the harmonious coexistence of English, the national language; and Spanish, the second most used language in our society.
2. Life in the American Southwest is bicultural and increasingly binational. In this Pan-American context, bilingualism will gain in importance. Equally important will be the collective ability of residents on both sides of the border to work harmoniously in pursuit of a common destiny that will be ever more intertwined. Schools must help children and youth develop skills and predispositions to face this challenge.
3. Mexico and the United States are becoming more interdependent. In this context, Mexican educators should have opportunities to contribute to improving education for Mexican immigrant children in U.S. schools. To enable this, schools must create pilot projects and an infrastructure for collaboration among institutions and individuals on both sides of the U.S.-Mexico border.

For more information, visit CBER in ED 440, call 480/965-7134, or access the CBER Web site at www.asu.edu/educ/cber.

Center for Indian Education. The Center for Indian Education is an interdisciplinary research and service center established in 1959. It promotes studies in American Indian policy and administration that contribute to scholarship and effective practices in education, professional training, and tribal capacity building. It is structured to foster relations between the university and sovereign tribes and to provide training and technical assistance for community programs. The center publishes the *Journal of American Indian Education* and sponsors workshops and colloquia that bring together scholars and tribal community leaders.

The center provides leadership through a group of American Indian faculty and is organized on the basis of scholarly expertise of the faculty. In addition to College of Education faculty, responsibilities are shared by faculty from the School of Social Work, the School of Justice Studies, the College of Liberal Arts and Sciences, and the College of Law. Areas currently studied include administrative leadership, policy analysis, bilingual education, health and welfare policy, justice studies, and program development in professional studies.

For more information, visit the center in ED 402, call 480/965-6292, or access the center's Web site at www.asu.edu/educ/cie.

CRESMET. See "Center for Research on Education in Science, Mathematics, Engineering, and Technology," page 27, for information about this joint venture of the Colleges of

Education, Engineering and Applied Sciences, and Liberal Arts and Sciences.

College of Engineering and Applied Sciences

Center for Low-Power Electronics. The Center for Low-Power Electronics (CLPE) is a collaborative effort of the University of Arizona and ASU to address fundamental, industry-relevant research problems in the design of ultra-low power microelectronic systems. The CLPE is formed under the State/Industry/University Cooperative Research initiative of the National Science Foundation (NSF). The NSF and the State of Arizona recognize that Arizona has the key ingredients to become a leader in this technology. It has the world's leading companies involved in the manufacture of portable computing and communication systems. The technical areas of focus of the Center for Low-Power Electronics include

1. basic materials, alternative materials, and their fabrication;
2. device design optimization;
3. design of digital, analog, and hybrid low-power circuits; and
4. power-based physical design for single- and multi-chip VLSI systems.

For more information, visit the center in ENGR 115, or call 480/965-8654.

Center for Solid-State Electronics Research. The Center for Solid-State Electronics Research (CSSER) focuses on research in the areas of epitaxial semiconductor crystal growth; device characterization and modeling; defect behavior in semiconductors material characterization; environmentally benign and other novel processing; fine line lithography; surface analysis; and transport. Major programs address semiconductor device modeling, transport theory, optoelectronics, ferroelectrics, semiconductor processing, microwave devices, and ultra-submicron and nanostructured devices. New thrust areas include molecular electronics and MEMS.

For more information, visit CSSER in ENGR 115, call 480/965-3708, or access the CSSER Web site at ceaspub.eas.asu.edu/csser.

Manufacturing Institute. The Manufacturing Institute is a joint venture of the College of Business and the College of Engineering and Applied Sciences, established to enhance manufacturing research and industrial collaboration at the interface between the two colleges. The mission of the institute involves integrating aspects of manufacturing in the business and engineering areas, and helping to fulfill the university's goal of becoming one of the leading educational and research institutions in manufacturing enterprise and manufacturing process technology issues. Research thrust areas include virtual manufacturing, enterprise systems, knowledge management, and software in the system solution.

For more information, visit the institute in GWC 402, or call 480/965-3709.

Center for System Science and Engineering Research. The Center for System Science and Engineering Research (SSERC) has established four focus areas: nonlinear dynamical systems, control theory and its applications,

mathematical neuroscience, and scientific computing and interdisciplinary systems engineering. The center is jointly sponsored by the College of Engineering and Applied Sciences and the College of Liberal Arts and Sciences. Its main goals are the creation and enhancement of interdisciplinary and cooperative research, graduate education, and public service programs in the areas of systems science, applied mathematics, and computation.

For more information, visit the SSERC in GWC 606, call 480/965-8382, or access the SSERC Web site at www.eas.asu.edu/~sserc.

CRESMET. See “Center for Research on Education in Science, Mathematics, Engineering, and Technology,” page 27, for information about this joint venture of the Colleges of Education, Engineering and Applied Sciences, and Liberal Arts and Sciences.

Telecommunications Research Center. Telecommunications play a vital role in home, commercial, entertainment, educational, scientific, and military systems. The Telecommunications Research Center focuses its interests and activities in research and educational programs. The approach is to conduct basic and applied research, develop technologies, and provide education programs in all major areas of telecommunications, from signal generation to reception. The targeted areas of excellence are antennas, propagation, and scattering; microwave circuits, devices, and measurements; optical communications; signal processing; broadband switching; and wireless communication systems. Ultramodern laboratories and computational facilities are associated with the center.

For more information, visit the center in GWC 411, or call 480/965-5311, or access the center’s Web site at trc.eas.asu.edu.

College of Law

Center for the Study of Law, Science, and Technology. Located in the College of Law, the Center for the Study of Law, Science, and Technology conducts research, edits *Jurimetrics: The Journal of Law, Science and Technology* in cooperation with the American Bar Association Section on Science and Technology, and sponsors seminars, workshops, and conferences. Through these activities, the center seeks to contribute to the formulation and improvement of law and public policy affecting science and technology and to the wise application of science and technology in the legal system. Current areas of research include communications and telecommunications law, computer-related law, forensic science and statistics, legal issues and biotechnology, law and medicine, and law and social science.

For more information, visit the center in LAW 201, or call 480/965-2124.

College of Liberal Arts and Sciences

Arizona Center for Medieval and Renaissance Studies (ACMRS). The Arizona Center is a research unit serving affiliate scholars from ASU, Northern Arizona University, and the University of Arizona. It represents a variety of disciplines, including history, literature, philosophy, religion, language, music, art, and science. ACMRS enriches academic offerings in medieval and renaissance studies by sponsoring one or two visiting professors each year. Gradu-

ate research assistantships are also available through the center.

Significant opportunities for the study of the Middle Ages and the Renaissance exist at ASU. Hayden Library has an extensive microfilm collection and many rare books in medieval and renaissance studies. ACMRS also sponsors a lecture series each semester covering a variety of topics.

Other programs include an annual conference, a public symposium, a summer study abroad program at the University of Cambridge (United Kingdom), and student exchange programs with the University of Copenhagen (Denmark) and the University of Kalmar (Sweden).

Since 1996, ACMRS has published Medieval and Renaissance Texts and Studies (MRTS), a major series of editions, translations, and reference works. In collaboration with the University of Massachusetts at Dartmouth and the Medieval and Renaissance Committee of the University of Michigan, ACMRS sponsors and coedits *Mediterranean Studies*, an annual interdisciplinary journal publishing articles on all aspects of the Mediterranean region. ACMRS also sponsors a book series titled “Arizona Studies in the Middle Ages and the Renaissance,” published by Brepols (Belgium).

ACMRS also partners with the Renaissance Society of America and the University of Toronto in “Iter,” a massive, retrospective, online medieval and renaissance bibliography covering all languages and disciplines, and is the official site of the Medieval Academy of America’s online data project offering information on medieval centers, programs, committees, and regional associations in North America.

For more information, visit ACMRS in SS 224, call 480/965-5900, or access the ACMRS Web site at www.asu.edu/clas/acmrs.

Cancer Research Institute. Significant advances in the treatment of human cancer and other serious medical problems depend upon scientists well trained in organic chemistry, biochemistry, and biology. The Cancer Research Institute provides graduate students with the specialized training necessary for research in the discovery and development of effective anticancer drugs. Among various activities, laboratory personnel are pursuing a unique program concerned with isolation, structural identification, and synthesis of naturally occurring anticancer agents from marine animals, plants, and marine microorganisms.

For more information, visit the institute in CRI 209, or call 480/965-3351.

Center for Asian Studies. Through its East Asian and Southeast Asian studies programs, the Center for Asian Studies serves as research coordinator for Asian studies’ faculty and graduate students in a variety of disciplines. The center sponsors colloquia and research conferences. It also publishes two scholarly *Monograph Series* and a newsletter on Southeast Asian studies, *Suvannabhumi*, which have an international readership. Graduate students may apply for research assistantships in the center and its program.

The center works with the office of International Programs to administer student exchange programs with a number of universities in Asia. The center also sponsors a graduate student colloquium and film series on Asian topics. A reading room is located in the center office suite offering a variety of Asian and English language publications and newspapers from and about Asia.

For more information, visit the center in WHALL 105, or call 480/965-7184.

Center for Meteorite Studies. The nation's largest university collection of extraterrestrial materials is available for research in the Center for Meteorite Studies. Teaching and research on meteorites, meteorite craters, and related areas of space and planetary science are accomplished through the regular academic units in cooperation with the center.

For more information, visit the center in PS C151, or call 480/965-6511.

Center for Solid-State Science. The Center for Solid-State Science is a research unit within the College of Liberal Arts and Sciences.

The membership comprises faculty and academic professional researchers and research support personnel, most of whom hold simultaneous appointments in affiliated academic units. The Center for Solid-State Science is the ASU focal point for interdisciplinary research on the properties and structures of condensed phases of matter at the interfaces between solid-state chemistry and physics, earth and planetary science, and materials science and engineering. It also supports interdisciplinary approaches to science and engineering educational outreach activities.

The center provides an administrative home for large, multidisciplinary, block-funded research projects. These include the NSF-supported Materials Research Science and Engineering Center (MRSEC) and the Interactive Nano-Visualization for Science and Engineering Education (IN-VSEE) project. To support these activities, members of the center operate modern and sophisticated research facilities and organize regular research colloquia and symposia.

Principal topical areas of research in the center include studies of structure and reactivity of surfaces and interfaces, electronic materials, advanced ceramics and glasses, synthesis of new materials, high-pressure research, development of techniques in high-resolution electron microscopy and micro-structural and chemical analysis, development of visualization techniques at different scales of magnification for science education and community outreach.

The research facilities of the center include the Center for High-Resolution Electron Microscopy (CHREM) and the Goldwater Materials Science Laboratories (GMSL).

CHREM. The center operates several ultra high-resolution and ultra high-vacuum electron microscopes and supports microscopy methods, and instrumentation development, including holography, position- and time-resolved nano-spectroscopy and energy-filtered imaging and diffraction. The center provides high-resolution capability for a large external group from other universities and industry.

GMSL. These facilities include

1. the Materials Facility (MF), which provides a wide range of synthesis and processing capabilities for preparation of specimen materials. MF also provides thermal analysis for study of solid-state reactions and Auger and X-ray photoelectron spectroscopy for analysis of surface compositions and electronic structure of surfaces;
2. the Materials Science Electron Microscopy Laboratory (MSEML), which provides state-of-the-art electron microscopes for analysis of microstructures, including imaging and diffraction, and high spatial

resolution chemical analysis using energy dispersive X-ray and electron energy loss micro-spectroscopy;

3. the Ion Beam Analysis of Materials (IBeAM) facility, which provides compositional and structural determination of the surface and near-surface regions (0–2mm) of solids by ion beam analysis where elemental composition and depth distribution information are needed. Channeling experiments are used to determine crystal perfection and site occupancy;
4. the Secondary Ion Mass Spectrometry (SIMS) laboratory, which provides depth profile and point composition analysis with very high chemical sensitivity, on the order of one part per billion, including isotopic analysis for many materials. SIMS is also used as a chemical microscope, to image elemental distributions on specimen surfaces;
5. the Scanning Probe Microscopy Laboratory (SPM), which provides facilities for nanoscale viewing of solid surfaces using scanning tunneling microscopy (STM), atomic force microscopy (AFM) and related techniques. The SPM laboratory serves as a focus for undergraduate research training programs, and educational and outreach activities;
6. the Facility for High-Pressure Research, which provides facilities for synthesis of new materials and for geochemistry/geophysics studies at up to 25 Gpa (250,000 atmospheres) and temperatures greater than 2000° C. These facilities are complemented by diamond anvil cells capable of in situ studies at up to one million atmospheres. This laboratory provides a focus for core research projects within the MRSEC;
7. the Goldwater Materials Visualization Facility (GMVF), which consists of a battery of linked workstations for remote operation of instruments and data collection, capture of images in real time, and advanced computing and simulation of materials. The GMVF is used in research and in undergraduate and graduate education, as well as in educational and community outreach; and
8. other specialized laboratories under development include high-resolution X-ray diffraction for thin film characterization, optical spectroscopy, and nuclear magnetic resonance spectroscopy for solid-state studies and research on materials under extreme conditions.

These facilities provide the primary teaching and research resources used by students in the Science and Engineering of Materials interdisciplinary Ph.D. program and the undergraduate option for Materials Synthesis and Processing. They are also used extensively by students in disciplinary programs from affiliated departments.

For more information, visit the center in PS A213, or call 480/965-4544.

Center for the Study of Early Events in Photosynthesis. The ASU Center for the Study of Early Events in Photosynthesis was established in 1988 as part of a joint grant program of the Department of Energy, the National Science Foundation, and the Department of Agriculture. In 1990, it was designated a Regents Center of the University. Since September of 1995, it has been funded by the Office of the

Vice Provost for Research and the College of Liberal Arts and Sciences. The center consists of about 90 students, post-doctoral associates, and research scientists led by 15 faculty members in the Department of Chemistry and Biochemistry and the Department of Plant Biology. These research groups share a common goal: understanding the process of photosynthesis, which is responsible for producing all of our food and filling the vast majority of our energy and fiber needs. The impetus for development of the center was the premise that photosynthesis is a complex problem that will only yield to an investigation using a wide variety of approaches and techniques. Thus, the center serves as an infrastructure supporting individual ASU scientists and fostering multidisciplinary cooperative research projects.

The ultimate objective of the research is the elucidation of the basic principles governing the biochemical and biophysical processes of photosynthetic energy storage. This goal is being realized via investigation of the early events of photosynthesis, including: light absorption and excitation transfer in photosynthetic antennas; the mechanism of primary photochemistry in plant and bacterial systems; secondary electron transfer processes; structure and assembly of photosynthetic antennas, reaction centers, and electron transfer proteins; pigment-protein interactions; artificial and biomimetic photosynthetic solar energy conversion systems; and mechanisms of biological electron transfer reactions.

The center is equipped with state-of-the-art instrumentation which allows students to do frontier research in a broad range of disciplines. Equipment includes a variety of pulsed lasers for measurements with time resolution ranging from sub-picoseconds to seconds; a 500 MHz NMR instrument; an EPR spectrometer; a protein X-ray facility; spectrophotometers; fluorometers; a protein sequencer; and an amino acid analyzer.

The center sponsors a weekly Photosynthesis Seminar Series and brings in visiting scientists from around the world to carry out collaborative research. Undergraduate, graduate, and postdoctoral training programs in the Department of Chemistry and Biochemistry and the Department of Plant Biology are central components of the activities of the center.



Center for the Study of Early Events in Photosynthesis alfalfa growth project

Tim Trumble photo

For more information, visit the center in PS D207, or call 480/965-1963.

CRESMET. See “Center for Research on Education in Science, Mathematics, Engineering, and Technology,” page 27, for information about this joint venture of the Colleges of Education, Engineering and Applied Sciences, and Liberal Arts and Sciences.

Exercise and Sport Research Institute. The Exercise and Sport Research Institute (ESRI) is an interdisciplinary research unit located in the Department of Exercise Science and Physical Education and serves, in part, as a research facility for the interdisciplinary doctoral program in exercise science. Faculty and graduate students within ESRI investigate a wide range of topics concerning physical activity, including different age cohorts, levels of health, levels of ability and fitness; and levels and types of training, and physical and emotional stresses, nutrition, and genetic backgrounds. Where applicable, these aspects are studied using an interdisciplinary approach. ESRI is affiliated with a number of clinical and research institutions in the Phoenix area.

ESRI houses numerous specialized research laboratories. *Biomechanics* applies the laws of mechanics to the study of human movement. Current research examines kinematic and kinetic determinants of locomotion patterns in walking, running, cycling, and swimming; neuromusculoskeletal modeling and computer simulation of locomotion in clinical and sport applications; ergonomics; and mechanisms underlying upper extremity repetitive strain injuries. *Exercise physiology* is the study of physiologic systems (cardiovascular, respiratory, muscular, endocrine, metabolic) under conditions of stress, particularly exercise stress. Both acute exercise responses and chronic adaptations resulting from exercise training are considered in relation to health and performance and are investigated in six specialized labs. The *Exercise Metabolism Lab* focuses on how dietary nutrients influence resting and exercise metabolism, with a special emphasis on diabetes; the *Exercise Biochemistry Lab* examines subcellular systems involved in the provision and regulation of energy transfer during exercise; and the *Exercise Endocrinology Lab* studies interrelationships of exercise and training with stress, hormones, neurotransmitters, and the immune system. Research conducted in the *Applied Exercise Physiology Lab* is aimed at better understanding how physical activity and exercise influence the health, fitness, and athletic performance of able-bodied and physically-challenged individuals. Research in the *Motor Control Lab* investigates how movement is regulated and controlled via the nervous system in normal and pathological populations. Special emphases include motor deficits attributed to basal ganglia dysfunction and upper extremity coordination, particularly finger and hand posture, in reaching and prehensile movements. *Motor development* studies how human movement is generated and evolves throughout the lifespan. Current research focuses on learning and development of bimanual coordination. Timing and coordination of perceptual-motor skills are measured in normal developing children, persons with Down syndrome, and adults to investigate cerebral asymmetries and specificity of learning. The *Sport and Exercise Psychology Lab* examines the relationship between psychological constructs and physical activity, and the influence of participation in physical activity on psychological phenomena. Current research is

designed to examine the influence of physical activity, fitness, and particular sport practices on psychophysiological mechanisms and cognitive functioning; the effect of psychological skills for performance enhancement; motivational aspects of physical activity across the lifespan; and the effects of exercise on mental health.

For more information, visit ESRI in PEBE 159, or call 480/965-7906.

Hispanic Research Center. The Hispanic Research Center (HRC) at ASU is an interdisciplinary unit, dedicated to research and creative activities, that is university-wide but administered through the College of Liberal Arts and Sciences. The HRC performs basic and applied research on a broad range of topics related to Hispanic populations, disseminates research findings to the academic community and the public, engages in creative activities and makes them available generally, and provides public service in areas of importance to Hispanics.

Faculty, staff, and advanced graduate students organize into working groups to develop a broad range of specific projects and lines of inquiry within the general categories of Hispanic entrepreneurship, science and technology, information and data compilation and dissemination, the Hispanic polity, and the arts. Ongoing activities of the HRC, primarily funded by external grants, include the Arizona Hispanic Business Survey, the *Bilingual Review Press*, the Community Art and Research Outreach (CARO), Chicana and Chicano Space: Art Education Web site, Digital Divide Solutions Project, Project 1000, and the Western Alliance to Expand Student Opportunities.

CARO sponsors creative activities and research in collaboration with community-based organizations and ASU faculty.

For more information, visit the HRC in CFS 104, call 480/965-3990, or access the HRC Web site at www.asu.edu/clas/hrc.

Institute of Human Origins. The Institute of Human Origins (IHO), founded in 1981 by Donald Johanson, became part of the College of Liberal Arts and Sciences in 1997. IHO is a multidisciplinary research organization dedicated to the recovery and analysis of the fossil evidence for human evolution and the establishment of a chronological framework for human evolutionary events. IHO's scientists carry out field research at sites in Africa, the Middle East, and Asia. IHO houses the largest collection of *Australopithecus afarensis* casts (including "Lucy," a 3.2 million-year-old human ancestor) in the world as well as an extensive collection of other fossil hominid casts. IHO's library contains more than 3,000 volumes, numerous journals, videotapes, audiotapes, and slides related to human evolution and fossil sites. IHO produces periodic newsletters, offers lecture series, conducts tours and workshops, and supports numerous informal science education outreach projects.

For more information, visit IHO in SS 103, call 480/727-6580, or access the IHO Web site at www.asu.edu/clas/iho.

Joan and David Lincoln Center for Applied Ethics. The Joan and David Lincoln Center for Applied Ethics (LCAE) is a university-wide center for applied ethics that is administratively housed in the College of Liberal Arts and Sciences. Its mission is

1. to develop and coordinate a strong focus on theoretical and applied ethics across intellectual disciplines and professional programs within the university,
2. to support teaching and creative research in ethics, and
3. to foster collaboration between the university and its varied publics to address major ethical challenges facing contemporary society.

For more information, visit LCAE in AG 361, or call 480/727-7691.

Latin American Studies Center. Arizona maintains an ever-growing interest in Latin America that draws upon an extensive experience of historical and geographical ties. The Latin American Studies Center is the focal point for these interests at ASU. Through its program, the center serves the university community and maintains strong ties with various Latin American organizations in the state and the nation. Principal activities are coordinating Latin American studies at the undergraduate and graduate levels; sponsoring student exchange programs; organizing events featuring Latin American arts and culture, numerous seminars, and research conferences; publishing a wide range of professional materials; and undertaking and facilitating research about the region.

The center administers student exchange programs with the Catholic University of Bolivia and three Mexican universities—the Autonomous University of Guadalajara, the Autonomous University of Nuevo Leon, and the University of Sonora. Each spring several ASU students are selected to attend courses at the Latin American universities while Bolivian and Mexican students attend ASU. The center also has an exchange agreement with the Pontificia Universidad Católica del Ecuador for faculty and students as well as summer programs in Quito, Ecuador and Ensenada, Mexico.

The center is a member of the American Modern Language Association, Consortium of U.S. Research Programs for Mexico, Consortium for Latin American Studies Association, Pacific Coast Council on Latin American Studies, Rocky Mountain Council for Latin American Studies, Consortium of Latin American Studies Programs, and Conference on Latin American History.

The center directly encourages research, not only through its research conferences, but also through close coordination with the Latin American collection of Hayden Library and networking with Latin American universities.

For more information, visit the center in SS 213, or call 480/965-5127.

College of Public Programs

Center for Nonprofit Leadership and Management. The mission of the Center for Nonprofit Leadership and Management (CNLM) is "to improve the quality of life in communities by enhancing the performance of nonprofit organizations." Varied strategies accomplish this mission and include coordination of educational offerings, selected technical assistance to nonprofits, support for research projects for faculty and students, and the convening of nonprofit leaders and managers through a variety of training opportunities. The center supports the activities of three complementary nonprofit management education programs: the ASU American Humanics Program (undergraduate

certificate), the Nonprofit Management Institute (extended education certificate), and a graduate certificate in nonprofit leadership and management. For more information, call 480/965-0607, or access the Web site at www.asu.edu/copp/nonprofit.

Center for Urban Inquiry. The Center for Urban Inquiry focuses on civic involvement. The center's mission is to examine the unique features of the new urban West in the United States, particularly intersections of growth and development with citizen activism and community building. By harnessing the unique resources of the university, the center engages in partnerships with urban citizens, including youths, to increase awareness, promote inclusion, and address needs. Center programs include seed grants to students working in teams in pursuit of urban research and community service; service learning that involves students in community building; technical assistance to neighborhood organizations, schools, and hospitals; and the production of works that appeal broadly to urban audiences, including performances, exhibits, and videos. For more information, call 480/965-9216, or access the center's Web site at www.asu.edu/copp/urban.

Morrison Institute for Public Policy. Established in 1981 by the Morrison family of Gilbert, Arizona, as a unit within the School of Public Affairs, the institute conducts research on public policy matters, informs policy makers and the public about issues of importance, and advises leaders on choices and actions. Morrison Institute offers a variety of services to public and private sector clients and pursues its own research agenda. Services include policy research, program evaluation, and public outreach. The institute's interests, research, and publications span such areas as education, urban growth, human services, workforce development, economic development, and arts and culture.

For more information, call 480/965-4525, access the institute's Web site at www.asu.edu/copp/morrison, or write

MORRISON INSTITUTE FOR PUBLIC POLICY
ARIZONA STATE UNIVERSITY
PO BOX 874405
TEMPE AZ 85287-4405

Herberger College of Fine Arts

Institute for Studies in the Arts. The Institute for Studies in the Arts (ISA) in the Herberger College of Fine Arts serves as a research laboratory for the development of new art forms, new ideas and concepts, and innovative technologies for artistic expression; a network for communication among creative scholars both within and outside the arts; and a resource base for the documentation, evaluation, and dissemination of research in the arts. ISA addresses the needs of a variety of populations through technical and monetary support and sponsorship for research projects, performances, exhibitions, and symposia.

ISA facilities include an experimental media performance space with an adjacent technology prototyping and applications studio in Drama City; the "Intelligent Stage," an interactive and tele-performance studio with state-of-the-art digital audio and video production and post-production facilities in Matthews Center; a Technology Development Studio for the development of prototype technologies and their application to aesthetic research; and comprehensive

archives that document the history of research initiatives supported by the ISA.

ISA is open to a wide range of proposals from faculty, graduate and undergraduate students, and visiting artists, provided such proposals address the ISA mission of experimentation and innovation in the arts. For more information, visit ISA in MCENT 224, call 480/965-9438, or access the ISA Web site at isa.asu.edu.

Vice Provost for Research

Center for Environmental Studies. Established in 1974, the primary mission of the Center for Environmental Studies is to facilitate collaborations among faculty researchers and to aid decision making about environmental issues. Through its collaborations, both with ASU faculty and partners from government, business, and the educational community, the center advances the identification of key local and global environmental issues and collects reliable information to be used by scholars, policy makers, and the general public. For more information, access the CES Web site at www.asu.edu/ces.

The center is also home to the Central Arizona–Phoenix Long-Term Ecological Research (CAP LTER) project, one of only two urban sites in the NSF-funded LTER network. The CAP LTER project focuses on an arid-land ecosystem profoundly influenced, even defined, by the presence and activities of humans, and involves more than 50 associated faculty from biology, ecology, engineering, geography, geology, sociology, urban planning, and anthropology. For more information, access the CAP LTER Web site at www.asu.edu/ces/CAPLTER.htm.

The center administers an NSF-funded Integrative Graduate Education and Research Training (IGERT) grant to develop a multidisciplinary program in urban ecology. The program's research component engages students in wide-ranging and multidisciplinary investigations into the ecology of cities, with the CAP LTER project providing the research infrastructure. For more information, access the IGERT Web site at www.asu.edu/ces/igert.htm.

The center also facilitates applied environmental research projects undertaken by the Southwest Center for Environmental Research and Policy (SCERP), a consortium of five U.S. and four Mexican universities. SCERP develops a research agenda for the study of air and water quality, hazardous waste problems, environmental health issues, and growth management questions in the border region.

For more information, contact the director, Center for Environmental Studies, Tempe Center (University and Mill), 480/965-2975, or access the center's Web site at www.asu.edu/ces.

ASU East

Sustainable Technologies, Agribusiness, and Resources Center. The focus of the Sustainable Technologies, Agribusiness, and Resources (STAR) Center is to bring together multidisciplinary researchers whose mission is to study sustainable processes and systems, whether natural or human designed, that will be efficient and less consumptive and will promote conservation of the earth. For more information, call 480/727-1240, or access the STAR Center Web site at www.east.asu.edu/research/star.

Student Services

The university is committed to the belief that an education involves more than attending class. While the assimilation of information is a central part of the university experience, learning about others, about independence and leadership, and about living in a complex society are equally important. Student Affairs' services and developmental programs reflect this philosophy.

UNDERGRADUATE ADMISSIONS

For many undergraduates, the first introduction to ASU is through the recruitment and admission programs of Undergraduate Admissions. Personal contact with prospective students through high school and community college visits and through student visits on campus are some of the approaches that provide information about the academic programs and support services available at ASU. A primary goal of Undergraduate Admissions is to identify, inform, motivate, recruit, and enroll students from ethnic groups underrepresented at ASU. Orientation programs ease the students' (and parents') transition to the ASU campus. Undergraduate Admissions also coordinates and supports the ASU Parents Association. For more information about undergraduate admissions, call 480/965-7788, or visit the Web site at www.asu.edu/admissions. For more information about the ASU Parents Association, call 480/965-2602.

STUDENT FINANCIAL ASSISTANCE

Pursuing a college education is an important life decision as well as a major financial investment. The cost of a college education can be a major concern for many students and their families. The ASU Student Financial Assistance Office is committed to helping students, within the limits of available funds, meet college costs. Options range from merit scholarships to financial aid awards—grants, loans, and employment.

Approximately two-thirds of the full-time students at ASU rely on some form of financial assistance to meet their educational expenses. For more information, call 480/965-3355, or visit the Web site at www.asu.edu/fastt.

REGISTRAR

Management of the registration system and maintenance of academic records are the primary responsibilities of the Office of the Registrar. InTouch, the ASU touch-tone telephone system for registration and fee payment, and the online registration system, accessible at any registrar site, including one at ASU West, ease the enrollment process and make ASU a national leader in the use of computerized registration. The Student Information System stores academic records and improves the quality of data used in academic advising. The Office of the Registrar coordinates applications for graduation and undergraduate readmission, course changes and scheduling, transcript services, applications for residency, and verification of enrollment. For more information, call 480/968-5988, or visit the Web site at www.asu.edu/registrar.

Veterans Services

This office offers complete educational services for U.S. veterans and their eligible dependents. Counseling about admissions, registration, and veterans benefits is available. Veterans programs provide service by advising all interested veterans and dependents about educational benefits and their optimum use. Students must apply each semester to receive veterans benefits. The program also assists veteran students in obtaining suitable paid tutors, when needed, using their federal benefits. Students receiving veterans educational benefits are not eligible to receive pay for audited courses. Veterans must achieve satisfactory GPAs and semester hours progress toward their academic programs for continued educational benefits, as stated under "Satisfactory Academic Progress," page 71. The university must report this progress to the Department of Veterans Affairs each term. Failure to maintain the minimum GPA established by the university and/or the veteran's college may result in academic probation or disqualification. Although veterans may be eligible for educational benefits while on academic probation, benefits could be affected by a continuing probation status. The Veterans Services Section is located in SSV 148. For more information, call 480/965-7723.

RESIDENTIAL LIFE

Living in one of the ASU Main residence halls provides students the opportunity to make the most of their college experience. Special residential communities for freshmen, honors students, students participating in sororities, and students in particular academic areas offer opportunities and activities that enrich the educational experience.

The Freshman Year Experience program (see "Student Development," page 37) provides a unique environment of classrooms, live-in tutors, academic advisors, and other support services designed to help freshmen develop skills for success.

Because the demand for campus housing tends to exceed space availability in the residence halls, students are encouraged to apply for housing early (before March 1, 2001) for the best chance to live on campus for fall semester 2001. Housing is not guaranteed. While applications are accepted at any time, assignment to a residence hall is not made until a student is admitted to the university. Requests for specially modified rooms for students with disabilities should be noted on the application.

ASU Main residence hall application information may be obtained at www.asu.edu/reslife, by phoning the HOME (Housing Options Made Easy) touch-tone telephone system at 480/303-3434, by calling 480/965-3515, or writing to

RESIDENTIAL LIFE
ARIZONA STATE UNIVERSITY
PO BOX 870212
TEMPE AZ 85287-0212

Information about ASU Main voluntary meal plans may be obtained by calling 480/965-3464 or writing

CAMPUS DINING
ARIZONA STATE UNIVERSITY
PO BOX 871101
TEMPE AZ 85287-1101

ASU East Housing

ASU East housing includes single student residence halls equipped with kitchens, two- to-five-bedroom houses, and a freshman residence hall that participates in ASU East's Freshman Year Experience program. For more information, see "Williams Campus Housing and Residential Life," page 605, call 480/727-1700, or access the Web site at www.asu.edu/east/cls/housing.

STUDENT DEVELOPMENT

ASU students experience success through active involvement in learning and within their community. Student Development enhances student learning through academic support services and programs and encourages student involvement in the community through participation in cocurricular programs, clubs, organizations, leadership opportunities, and service. These programs and services, as well as those within Student Affairs, are supported by Student Development with data collection, research, and evaluation, ensuring a successful ASU experience for students.

Freshman Year Experience

A student's freshman year is a time to learn new ideas, meet new people, and grow as an educated citizen ready to contribute to the community. The Freshman Year Experience (FYE) helps freshmen achieve academic success by coordinating services and programs in settings designed just for freshmen. Services provided include freshman-level classes and academic advisors in the halls, computer labs, live-in tutors with tutoring offered five nights a week, staff trained to support students in achieving academic success, and special floors for freshmen majoring in Engineering; Business; Architecture and Environmental Sciences; and Broadcasting, Communication, and Journalism (within the College of Public Programs).

ASU has designated several residence halls as FYE service sites: Manzanita, Mariposa, McClintock, Palo Verde complex, Sahuaro, and Sonora. The Off-Campus FYE Student Center is located on the first-floor student lounge of McClintock Hall. A freshman can choose to live in one of the halls and have direct access to FYE programs or opt to live off-campus or in another residence hall and still use FYE services. For more information, call 480/965-1512, or access the Web site at www.asu.edu/vpsa/fye.

Learning Resource Center

The Learning Resource Center (LRC) provides academic support to ASU students through tutoring in most disciplines, Supplemental Instruction™ (SI), peer coaching, academic success workshops, and computer-assisted instruction. The LRC tutoring program is certified by the College Reading and Learning Association, a national organization of learning-assistance professionals. SI provides students in traditionally challenging courses with the opportunity to meet with an SI leader, a student who has successfully completed the course, for collaborative study-skills sessions that focus on the course material.

The peer coaching program assists ASU students on or at risk of academic probation by providing a structured learn-

ing environment that focuses on helping students develop time- and stress-management skills. The academic success workshops offer the opportunity to develop general academic skills and college adjustment/survival skills such as coping with test anxiety, organizational skills, and critical thinking. Computer-assisted instruction is open to all ASU students, staff, and faculty, and addresses learning software applications, Internet use and research, and Pine e-mail.

For more information, call the LRC at 480/965-6254, or access the Web site at www.asu.edu/vpsa/lrc.

Cocurricular Programs

Cocurricular Programs (CCP) works to enhance the ASU undergraduate educational experience by maximizing faculty and student interaction outside the traditional classroom setting. This is accomplished through three program components:

Campus Wide Programming. CCP brings students and faculty together for a variety of events, such as Student/Faculty Luncheons and Dinners and the Student/Faculty Retreat, to facilitate informal dialogue, exchange of ideas, and out-of-classroom learning experiences. The annual Last Lecture Series offers students the opportunity to recognize and honor excellent teaching by nominating outstanding faculty to present a lecture to the ASU community as though this would be their "last lecture."

Residential Programming. CCP supports Resident Assistants in the development of programs that promote the themes of leadership, diversity, and service/civic responsibility. Programs like the Classic Film Colloquia bring students and faculty together to explore ideas and topics that supplement and enhance their classroom learning. Other programs have included Coffee Talks and Open-Mic Nights, where students and faculty have the opportunity to interact in a fun, informal setting.

Seminar Courses. CCP coordinates a number of small group seminar courses each semester, entitled CED 394: Special Topics in Leadership. These one-semester-hour, discussion-format courses bring together a faculty or staff member and up to 12 students to discuss and learn about a specific interest or topic. CED 394 courses are open to students of all academic levels and majors.

Faculty take an active role in the planning and development of CCP programs. Faculty Fellows serve as liaisons with their academic departments and their colleagues, further enhancing the learning experiences of students outside the traditional classroom.

For more information on upcoming programs or seminar courses, call Cocurricular Programs at 480/965-9600, or access the Web site at www.asu.edu/vpsa/partnerships.

Child and Family Services

Child and Family Services (CFS) provides resource and referral services to students, faculty, and staff. Information about the Campus Children's Center (480/921-2737), Child Development Laboratory (480/965-7267), Child Study Laboratory (480/965-5320), and the College of Education Preschool (480/965-2510) may be obtained at CFS or by calling the programs directly. CFS maintains a child care referral database and coordinates workshops and discussion groups on child and elder care issues. Educational materials and listings of additional on- and off-campus activities,

programs, and services for children and their families are available at the CFS office, MU 14C. Appointments are recommended.

For more information, call 480/965-9515, or visit the Web site at www.asu.edu/vpsa/family.

Sun Devil Involvement Center

Located on the third floor of the Memorial Union, the Sun Devil Involvement Center coordinates student involvement opportunities, ranging from Greek Life to off-campus volunteer services. For more information, call 480/965-2255.

Student Organization Resource Center

The Student Organization Resource Center provides opportunities for students to get involved with established campus organizations and helps students start new organizations. The center maintains a list of all registered groups, assists with the coordination of major events, and provides a resource desk where students can access information on student activities and leadership opportunities. Members of REACH, a student paraprofessional organization, staff an information desk and are available for outreach sessions. For more information, call the center at 480/965-2249 or the Sun Devil Involvement Center at 480/965-2255, or visit the Web site at www.asu.edu/clubs.

Student Leadership Programs

Student Leadership Programs serves as a resource to students interested in leadership development. Resources include a leadership library and information about the ASU Leadership Development Model and other campus, local, and national leadership programs. Staff are available for presentations; workshop facilitation; and advising, guidance, and coordination of efforts in leadership development. For more information, call 480/965-2255, or visit the Web site at www.asu.edu/vpsa/slp.

Leadership Development Classes. A series of leadership development classes are offered to provide students an opportunity through class activities, discussions, and experiences to understand leadership theories and models, to develop leadership skills, and to apply leadership knowledge through service and internships. CED 294 ST: Foundations of Leadership focuses on the basic principles of leadership and current writing on the topic, particularly on college campuses. A capstone course, CED 484: Leadership Internship, applies leadership skills through internships. In this course, students serve as facilitators for the Foundations in Leadership Discussion Section, provide service and leadership in special group projects, or serve as student government interns. For more information, access the Web site at www.asu.edu/vpsa/slp/Classes.

Greek Life

Involvement in a fraternity or sorority can be one of the most rewarding aspects of a student's college experience. Fifteen fraternities and 12 sororities provide opportunities for leadership development, academic success, campus involvement, community service, social interaction, brotherhood/sisterhood, and intramural participation. These organizations are governed by the Interfraternity Council and the Panhellenic Council. The National Panhellenic Council offers nine predominantly African American fraternities and sororities for involvement with community service, cultural learning, and a deep sense of tradition. The Hispanic Greek

Council, three fraternities and two sororities, offers Hispanic students an opportunity to work on service projects, give back to the Latina/Latino culture, and network within the Hispanic community. In addition to the benefits of lifelong membership, many of the fraternities and sororities have chapter houses or residence hall floors that provide a rewarding living/learning option for their members. For more information, call Greek Life at 480/965-2255, or visit the Web site at www.asu.edu/vpsa/greeklife.

Community Service Program

The Community Service Program strives to engage students, faculty, and staff in meaningful cocurricular service. Through the integration of academic studies with public service, the campus community is provided with intentional avenues to serve the basic and greater societal needs of Valley communities. By engaging students in worthwhile service while promoting a lifelong commitment to citizenship and social justice, the Community Service Program not only augments curricular learning but also affords students the key opportunity to turn learning into social action.

For more information, visit the Community Service Program, located at the Sun Devil Involvement Center on the third floor of the Memorial Union, access the Web site at www.asu.edu/vpsa/community, or call 480/965-9843.

Short-Term Service Projects. The Community Service Program collaborates with Valley-wide agencies and campus entities to provide meaningful episodic service events such as Alternative Spring Break, the Fall Service Plunge, and the Martin Luther King Jr. Day of Service. Current information can be found in updated listings in the office and on the Web site on a weekly basis.

Cocurricular Service Learning Opportunity Clearinghouse. A detailed clearinghouse of information from more than 400 social service and nonprofit agencies across the Valley of the Sun offers information about internships, post-graduation opportunities, and long-term service. Students can use this resource to design a service experience that complements their academic, personal, and professional goals.

Cocurricular Service Learning in the Classroom. The Community Service Program works with faculty and instructors on campus to successfully integrate cocurricular service learning into the classroom setting. Information regarding courses that integrate cocurricular service learning is available for students, and the resources are open to students as they seek to meet course requirements.

Workshops and Skill-Building. Throughout the year, the Community Service Program offers workshops and presentations around service-related topics to develop strong campus leaders and exceptional civic leaders for the future. Topics may include servant leadership, volunteer management, event planning, and reflection. Workshop series information is available in the office.

STUDENT LIFE

Student Life strives to enhance student learning and student achievement by fostering a positive, inclusive campus environment; providing services to meet the needs of a diverse student body; and empowering students to advocate for their needs and interests by developing leadership and

life skills. Opportunities for leadership and community involvement help students prepare for their roles as responsible citizens. Students learn and sharpen their leadership skills through their involvement in student activities, workshops, community service, and student government. For more information, access the Web site at www.asu.edu/studentlife.

Adult Reentry Program. The Adult Reentry Program provides students age 25 and older with a variety of services designed to help them meet their goals, such as preenrollment assistance, orientation, support/networking groups, resource and referral information, peer mentoring, scholarships, and leadership development. The Adult Reentry Program is located in the Memorial Union, Room 14. For more information, call 480/965-2252.

Associated Students of Arizona State University (ASASU). ASASU is the student government of the university and the official representative of the student body in matters of university governance and budgeting. Through paid, volunteer, or elected positions, students can become active, contributing members of ASASU. Students can select from a wide variety of activities and services, some of which include: College Councils, Student Senate, Student Legal Assistance, Safety Escort Service, Co-op Bike Repair Service, Environmental Issues, Internships, and Homecoming and spring event committees. For more information, call 480/965-3161.

Danforth Chapel. Built in 1948 as a multi-faith chapel and retreat for the university community to use for prayer, meditation, weddings, memorial services, baptisms, Bible study groups, and worship, Danforth Chapel continues to provide opportunities for those functions. The chapel is located on Cady Mall between the Memorial Union and Hayden Library. For more information, call 480/965-3570.

Disability Resources for Students. Disability Resources for Students (DRS) facilitates equal access to educational and cocurricular programs, campus activities, career exploration, and employment opportunities for qualified ASU students with disabilities, ensuring they are provided with mandated reasonable and effective accommodations. A U.S. Department of Education TRIO Student Support Services Grant also allows DRS to incorporate a unique academic enhancement model into the disability support services program for 270 selected students with disabilities who meet TRIO eligibility requirements. Disability documentation is required and information regarding disabilities is confidential. DRS is located in the southeast corner of the Matthews Center. For more information, call 480/965-1234 (voice) or 480/965-9000 (TTY), or fax 480/965-0441.

Educational Opportunity Center. This community outreach service focuses on low-income individuals. The center offers vocational testing and guidance as well as assistance in application for admission, scholarships, and financial assistance at a postsecondary institution suited to a particular individual's needs. Services are free, partially funded by the U.S. Department of Education. The center has a main office at 1000 East Apache Blvd., Suite 118 in Tempe and satellite offices around Maricopa County. For more information, call 480/894-8451.

International Student Office. The International Student Office (ISO) is responsible for the administration and coordination of ASU's international student program. The ISO's principal responsibilities and services include initial orientation, counseling and advising, administrative support, and campus and community activities which promote international awareness and enrich the educational experiences of students. The ISO is located in SSV 265. For more information, call 480/965-7451.

Multicultural Student Center. The Multicultural Student Center (MSC) provides a central location for multicultural students to receive a number of services designed to assist them in pursuing academic success. Staff actively seek to recruit and retain multicultural students through a variety of support services and programs. University success courses, one-on-one guidance, consultation, and referral are offered to address the academic, personal, and cultural needs of multicultural students. The Hispanic Mother/Daughter Program and the Native American Achievement Program are specialized programs within the MSC designed to increase the persistence and graduation rates of students. Summer programs such as the Asian Lead Academy, the Native American Summer Institute, the Academic Enrichment Program, and Sun Devil Welcome provide outreach to the community and assist students with their transition and adjustment to the university. The student coalitions, as well as other multicultural student organizations, provide cultural programming and academic support to African American, American Indian, Asian American, Hispanic/Latino, gay and lesbian, and women students. The MSC office is located in SSV 394. For more information, call 480/965-6060.

Student Advocacy and Assistance. Student Advocacy and Assistance guides students in resolving educational, personal, and other campus impediments toward successful completion of their academic goals. Student Advocacy and Assistance links students with appropriate university and community resources, agencies, and individuals; collaborates with faculty and staff in the best interest of the students; and follows through to bring efficient closure to student concerns. Student Advocacy and Assistance is located in the Office of Student Life, SSV 263. For more information, call 480/965-6547.

Student Judicial Affairs. Student Judicial Affairs oversees the review of conduct issues, involving both students and student organizations, as set forth by the Arizona Board of Regents *Student Code of Conduct*. This code is designed to balance the rights and needs of the individual with the responsibility of the individual to meet the needs of the community. Referrals for student conduct issues are accepted from faculty, staff, students, or observers. The Student Judicial Affairs designee reviews all referrals. Students who are found to have violated the *Student Code of Conduct* are subject to appropriate sanctions for student misconduct. Student Judicial Affairs is located in the Office of Student Life, SSV 263. For more information, call 480/965-6547.

Student Legal Assistance. Student Legal Assistance counsels and advises students regarding their legal rights and responsibilities. This service is offered free of charge to currently enrolled ASU students. Notary services are also available. Typical consultation topics include auto-related

issues, criminal matters, debt, domestic relations, wills, towing and traffic violations, landlord/tenant issues, and miscellaneous issues. Student Legal Assistance is located in the Memorial Union, Room 329. For more information, call 480/965-6307.

Upward Bound Program. Upward Bound is a college preparatory program designed to increase the academic skills and motivational levels of participants (low income, potential first-generation college students) to encourage their completion of high school, as well as enrollment in and graduation from postsecondary institutions. The year-round program includes summer residential components funded by the U.S. Department of Education. The Upward Bound Program office is located in SSV 276. For more information, call 480/965-6483.

Veterans Upward Bound. This program is designed for veterans who wish to pursue postsecondary education but whose life experiences did not adequately prepare them for the educational requirements of today. College preparation instruction in writing, reading, mathematics, general science, study skills, and computer literacy are provided to suit each veteran's individual needs. Veterans lacking a high school diploma can also prepare for obtaining their General Education Development (GED) while participating in Veterans Upward Bound. Interest inventory assessments and career advising are also available. All services are free, funded by the U.S. Department of Education. The Veterans Upward Bound office is located at 1000 East Apache Blvd., Suite 106, in Tempe. For more information, call 480/965-3944.

COUNSELING AND CONSULTATION

Counseling and Consultation provides confidential counseling services to all ASU students. The psychologists, counselors, psychiatrists, and social workers on staff help students with almost any type of problem or issue related to adjusting to college life. The staff is particularly committed to helping students of color and nontraditional students adjust to campus life.



Glen Gilbertson uses equipment in the ADA area of Hayden Library.

Tim Trumble photo

Counseling and Consultation offers counseling groups for career exploration, relationship difficulties, substance abuse, stress management, depression, assertiveness, eating disorders, family problems, and other common student issues. Individual therapy and couples counseling are offered on a short-term basis. Counseling and Consultation also provides emergency counseling to students experiencing an emotional crisis.

A career interest testing program is available to both students and nonstudents. Other services available to the ASU community include consultation and outreach services to faculty and staff, academic instruction, research, a master's-level practicum training program, and an APA-approved clinical internship program for doctoral students in counseling and clinical psychology. Students may schedule an initial counseling appointment either by phone (480/965-6146 or 480/965-4726) or in person. After an initial personal consultation and three free individual sessions, full-time students are charged \$12 per session. Counseling and Consultation is located in SSV 334 and SHS A168.

Testing Support Services. Testing Support Services (TSS) offers courses to help students prepare for the following graduate entrance exams: the Graduate Record Exam (GRE), the Graduate Management Admissions Test (GMAT), and the Law School Admission Test (LSAT). Also, students may select additional individual tutoring sessions for these exams. Students may get information about test preparation workshops by phone (480/965-6777) or in person. The TSS office is located in SSV 382.

STUDENT HEALTH AND WELLNESS CENTER

Services. The Student Health and Wellness Center offers fully accredited outpatient health care to all students enrolled at ASU. The professional staff, consisting of physicians, nurse practitioners, registered nurses, dietitians, and health educators, has special interest and training in college health care. Consultant physicians in dermatology, orthopedics, and other specialties are on-site and are available by referral from a member of the Student Health and Wellness Center professional staff.

Additional services include comprehensive women's health care, immunizations, a travel clinic, and an allergy clinic for students needing periodic injections. The pharmacy at the Student Health and Wellness Center provides many prescription and over-the-counter medications at reasonable costs. Radiology and laboratory services are also available.

A notarized parental "consent to treat" form is required before a student under 18 can receive treatment at the Student Health and Wellness Center. A copy of the parental consent form may be obtained from the Student Health and Wellness Center's Web site at www.asu.edu/health.

For information about Student Health Services at ASU East, call 602/222-6568.

Health Education. The Student Health and Wellness Center provides educational programs on nutrition, stress management, alcohol and other drug use and abuse, sexuality, and sexually transmitted diseases, including the Human Immunodeficiency Virus (HIV). Peer education programs provide students an opportunity to gain experience in health education and to enhance presentation skills. Services and educational brochures are available at the Student Health

and Wellness Center and at other locations on campus.

Hours. Students are strongly encouraged to schedule appointments to minimize waiting time and to allow students the opportunity to establish a relationship with one clinician. Appointments are available by calling 480/965-3349. Patients with urgent health care problems may be seen at the Student Health and Wellness Center's Acute Care Clinic on a same-day basis. The clinic opens at 9 A.M. Tuesdays and Thursdays and 8 A.M. other weekdays. It closes at 5 P.M.

Fees. Full-time students are not charged for primary care visits at the Student Health and Wellness Center. There are charges for consultant visits, radiological procedures, laboratory procedures, medications, certain special or surgical procedures, and certain health education services. Patients receiving medical treatment off campus, such as consultations, emergency care, and hospitalization, are responsible for any resulting charges.

Insurance. *While the Student Health and Wellness Center provides comprehensive ambulatory care, it is not a substitute for health insurance.* Medical insurance coverage is strongly recommended for all students and is required for international students. Eligible students and dependents may enroll in health insurance coverage arranged by ASU. Dependents must complete an application and may require underwriting approval by the insurance carrier. The coverage assists students in paying for laboratory and radiology procedures, off-campus consultations, hospitalization, surgery, and emergency and after-hours care. Students may purchase health insurance through InTouch, the ASU touch-tone telephone registration system, or at any registrar site. For more information, call the Student Health and Wellness Center's insurance office at 480/965-2411.

STUDENT MEDIA

The activities of Student Media are most visible in the *State Press*. The campus newspaper, one of the largest daily newspapers in Arizona, is published five days a week by ASU students who make editorial decisions with the support of an experienced university staff director.

The *State Press* provides students with on-the-job training in newswriting, photography, editing, advertising, and production work. The *State Press* also addresses the many informational needs of the university community, not only through stories about the campus, and local and national events, but through paid advertisements by area merchants, campus groups, and university faculty, students, and staff. *The Web Devil* is Student Media's online news center and community guide, including complete listings of restaurants, hotels, apartments, transportation, campus maps, and fun places to go within the community surrounding ASU. Access the Web site at www.statepress.com.

Student Media publishes *Hayden's Ferry Review* twice a year. This award-winning national literary and art magazine brings together in one publication the finest contemporary literature and art by established and emerging writers and artists. Access the Web site at www.statepress.com/hfr.

Student Media provides complete prepress services to the university community. For more information, call 480/965-7572.

MEMORIAL UNION

The Memorial Union (MU) serves as the campus community center for students, faculty, and staff. Opportunities for involvement are abundant with programs and services that enhance the ASU experience. Students can connect with clubs, organizations, activities, student government, and community service/volunteer programs.

Also offered in the MU is a wide variety of student employment opportunities in the following areas: building management, administrative support, computer services, event and meeting services, information desk services, maintenance, and Sparky's Den services.

The MU features a computer lab and workshop; study and group work areas; multiuse meeting rooms; Sparky's Den: the recreation center, with bowling, billiards, and video games; and an art gallery.

Services provided include assorted food venues, bank, card and gift shop, catering, credit union and various ATMs (automated teller machines), event and meeting services, hair salon, music store, post office, and travel agency. For more information about any of these services or to explore employment or volunteerism, call the Information Desk at 480/965-5728, or visit www.asu.edu/mu on the Web.

CAREER SERVICES

Career Services provides advising for individual career planning concerns and offers information about numerous career fields and permanent positions. Students are encouraged to use the Career Development Center throughout their academic careers. A computerized career planning system assists students in evaluating and making career choices. Career Services offers workshops and classroom presentations on career planning, interviewing skills, résumé writing, and a myriad of additional career-related topics. Advisors are available to assist students on an individual basis in career planning and employment.

Hundreds of employers from business, industry, government, social service agencies, health organizations, and educational institutions come to ASU to interview students seeking permanent positions and career-related summer, intern, and co-op employment. Career Services facilitates these interviews for both employers and students to meet each group's needs and interests. In addition, career and job fairs are scheduled throughout the year.

The agency's services support students' career development throughout their college experience, and Career Services encourages participation in programs as early as the student's freshman year. The office is located in SSV 329. For more information, call 480/965-2350.

STUDENT RECREATION COMPLEX AND RECREATIONAL SPORTS

The Student Recreation Complex (SRC) is the place to become involved and meet people with similar interests in an active lifestyle. Student Affairs' Recreational Sports is one of the largest programs of its kind in the country, serving more than 27,000 students annually. Programs offered include intramural sports, informal recreation, fitness, aquatic and sports skills classes, outdoor recreation, children and family programs, sport clubs, adaptive recreation for individuals with long- or short-term

disabilities, a wellness program, safety education, experiential learning, and special events.

Located on the south end of Palm Walk, the SRC is one of the finest student recreation facilities in the United States. Features include a variety of resistance and cardiorespiratory equipment, a 9,000 square-foot weight room, three large gymnasiums, 14 indoor racquetball courts and one squash court, martial arts, aerobics and sport club rooms, outdoor equipment rental, and an adaptive weight area. Outdoor facilities include a lighted, multiuse complex with four fields, a .43-mile perimeter walking and jogging path, four sand volleyball courts, 14 tennis courts, and a 70-meter swimming pool with two movable bulkheads that allow the pool to be divided into three parts for simultaneous multiuse programming.

For more information, call 480/965-8900, stop by for a tour, or visit the Web site at www.asu.edu/src.

ARIZONA PREVENTION RESOURCE CENTER

The Arizona Prevention Resource Center (APRC) is a partnership among ASU, the Governor's Division of Drug Policy, the Arizona Department of Education, and the Arizona Department of Health Services.

The APRC serves as a centralized source for individuals, schools, and communities throughout Arizona to support, enhance, and initiate programs focused on the prevention of the use of tobacco products and the use and abuse of alcohol and other drugs; gangs and violence; and other areas, such as health promotion, domestic violence, and dropout prevention. The APRC operates in the following program areas:

1. Clearinghouse—provides accurate, timely, and personalized prevention information and materials through in-house library, access to national sources, and linkages between prevention programs in Arizona.
2. Training and Technical Assistance—provides high quality, responsive training and technical assistance for organizations and individuals undertaking prevention programs in local communities and schools; focus is on research-based (promising and proven) practices.
3. Evaluation and Accountability—coordinates and provides leadership for a statewide evaluation strategy for accountability in alcohol and other drug prevention and treatment programs; produces an annual inventory of substance abuse and gang prevention and treatment programs in Arizona; designs and conducts contracted evaluations of community-based prevention programs; promotes accountability in all aspects of APRC operations.
4. Strategic Initiatives and Planning—promotes effective collaboration between prevention and treatment program leadership; broadens the funding base for prevention programs; researches and develops strategies for comprehensive statewide systems and accountability.

For more information, call 480/727-2772 or toll-free at 1-800-432-2772, visit the Web site at www.asu.edu/aprc, or write

ARIZONA PREVENTION RESOURCE CENTER
ARIZONA STATE UNIVERSITY
PO BOX 872208
TEMPE AZ 85287-2208

Information can also be obtained by fax, at 480/727-5400, or at 641 East Van Buren, Suite B2, in Phoenix.

The Arizona Drug and Gang Prevention Resource Center (ADGPRC), located with the APRC, provides similar information and technical assistance for communities to help them focus strategically on drug and gang prevention issues.

The ADGPRC can be contacted at 480/727-5015 or toll-free at 1-888-432-2347, or visit the Web site at www.asu.edu/adgprc.

INTERCOLLEGIATE ATHLETICS

The university is a member of the National Collegiate Athletic Association, Division I, and the Pacific-10 Conference. The university has 21 varsity intercollegiate sports and more than 500 participants. Intercollegiate athletics at ASU are governed by a board of faculty, students, and staff under the regulations of the Arizona Board of Regents, the NCAA, the Pacific-10 Conference, and the university. Policies are administered by Intercollegiate Athletics. All athletic grants-in-aid and scholarships are administered in coordination with Intercollegiate Athletics.

RELIGIOUS ACTIVITIES

Various religious centers representing most major religious groups are available near ASU Main and provide students with opportunities to participate in programs of religious worship and to meet other students through social activities. For more information, call the Campus Interfaith Council at Danforth Chapel, 480/965-3570.

OTHER OPPORTUNITIES FOR STUDENT INVOLVEMENT

Dance. The Department of Dance and Dance Arizona Repertory Theatre, a student touring outreach company, present 12 to 14 faculty- and/or student-directed concerts a year. Interested students should attend open auditions, held at the start of each semester. For more information, call 480/965-5029.

Forensics. The ASU Forensic squad, associated with Pi Kappa Delta national forensic honorary association, travels to trophy tournaments across the country. For more information, call the director of Forensics, at 480/965-5095.

Communication Activities: Performances. Participants write, compile, and perform scripts for presentation in diverse on- and off-campus settings through the Hugh Downs School of Human Communication. For more information, call 480/965-4111.

Music. Performing organizations with the School of Music provide opportunities for involvement and credit, including bands, Lyric Opera Theatre, symphony orchestra, and university choral organizations. For more information, call the School of Music at 480/965-3371.

Theatre. The University Theatre presents four to six faculty-directed productions and eight to 14 student-directed productions a year. Audition information is available from the Department of Theatre, GHALL 232, 480/965-5359.

Fees, Deposits, and Other Charges

The Arizona Board of Regents reserves the right to change fees and charges without notice. The latest *Schedule of Classes* usually reflects up-to-date fee amounts. The following fees apply to both credit and noncredit (audit) registrations.

DEFINITIONS

Resident tuition refers to the charge assessed to all resident students who register for classes at ASU. *Nonresident tuition* refers to the charge assessed to nonresident students, as established in Arizona Board of Regents' Policy 4-102.

ACADEMIC YEAR TUITION

The resident and nonresident tuition for fall and spring semesters is shown in the "2000–2001 Resident and Nonresident Tuition" table, on this page. The amounts listed are per semester hour each academic term. For more information on classification for fee status, see "Residency Classification Procedures and Policies," page 46.

Students registered for seven or more hours are considered full-time for tuition payment purposes. See "Enrollment Verification Guidelines," page 67.

Note: The rate for one hour is charged if the student is registered for only a zero-hour class.

Graduate College Differential Fees. Certain graduate programs assess an additional differential fee. These fees differ according to college and/or program. Contact the program advisor for details on these fees.

Off-Campus and Independent Learning Courses. For information on fees for off-campus and independent learning courses, see "Distance Learning Technology," page 688.

Summer Sessions Fees. The 2001 registration fee per semester hour is \$119 except for law students. The registration fee per semester hour for law students is \$263. For more information, see "Summer Sessions," page 520, and the *Summer Sessions Bulletin*.

OTHER FEES, DEPOSITS, AND CHARGES

Special Class Fees and Deposits. Certain university classes require payment of fees or deposits for materials, breakage, and rentals. These fees and deposits are listed in the *Schedule of Classes* for each semester.

Student Recreation Complex Fee. All students (except university employees) who take at least one class at ASU Main must pay a mandatory Student Recreation Complex fee. Full-time (seven or more hours) students are charged \$25 per semester. Part-time students pay \$12 per semester, and summer students pay \$2 per semester hour. See the latest *Schedule of Classes* for more information.

2000–2001 Resident and Nonresident Tuition

Hours	Resident*	Nonresident*
1	\$ 119.00	\$ 405.00
2	238.00	810.00
3	357.00	1,215.00
4	476.00	1,620.00
5	595.00	2,025.00
6	714.00	2,430.00
7	1,136.00	2,835.00
8	1,136.00	3,240.00
9	1,136.00	3,645.00
10	1,136.00	4,050.00
11	1,136.00	4,455.00
12 or more	1,136.00	4,864.00

* Tuition is subject to change for 2001–2002. In addition to tuition, students are charged other fees (e.g., the Student Recreation Complex fee and financial aid trust fee).

Financial Aid Trust Fee. All students must pay a financial aid trust fee. Full-time students (enrolled for seven or more hours) are charged no more than 1 percent of the current tuition. The fee for students enrolled six or fewer hours is half that charged full-time students. The total summer sessions fee does not exceed the amount for a full-time student. Fees collected from students are matched by the State of Arizona and used to create a Financial Aid Trust Fund, from which student grants are awarded under the usual financial aid eligibility criteria used by the ASU Student Financial Assistance office.

Arizona Students' Association (ASA) Fee. The ASA is a nonprofit lobbying organization that represents Arizona's public university students to the Arizona Board of Regents, State Legislature, and U.S. Congress. In 1997, students at the state universities voted to change the mechanism for funding the ASA. A \$1 fee is charged to each student each semester. Any refunds for this fee are provided through the ASA Central Office.

Late Registration. The fee assessed on registrations on or after the first day of each session is \$35. A \$35 late fee is also assessed on registration payments received after the fee payment deadline but processed before the class enrollment purge.

Admission Application. The nonrefundable fee for nonresident undergraduate admissions or readmission applications is \$40. The nonrefundable fee for graduate nondegree or readmission applications is \$15.

Transcripts. The Office of the Registrar releases official transcripts *only upon the written request of the student*. The request must include the following information:

1. the student's name and former name(s);

2. the student ID number;
3. the date of birth;
4. the dates of attendance;
5. a return address;
6. specific address to mail transcript;
7. student's signature; and
8. appropriate fees (as described below).

The Request for Official Transcript form is available online at www.asu.edu/registrar/forms.

The Office of the Registrar does not issue a transcript if the student has a financial records hold. The student must supply a specific address if the transcript is to be mailed.

The fee for an official transcript for a student not enrolled is \$5 for the first copy. Additional copies ordered at the same time are \$1 each. The fee is \$1 per copy for a student enrolled for a current or future semester.

Unofficial transcripts may be requested in person at the Office of the Registrar, any registrar site, or by mail or fax (480/965-2295) if a signed release is enclosed. There is no charge for an unofficial transcript.

All in-person transcript requests require presentation of photo identification. Requests are not accepted from third parties without a written release from the student. For information on parental access to records, see "Access to Records," page 73.

Copies of Education Records Other Than ASU Transcripts. For fewer than six pages, there is no charge. For six to 10 pages, the total charge is \$2. For 11 to 15 pages, the total charge is \$3. Copies of additional pages cost \$1 for every five pages copied.

Comprehensive Examination. This fee is paid by all students seeking to establish credit by examination and is \$50 per semester hour.

Private Music Instruction. The fee for one-half hour of instruction weekly is \$40. The fee for one hour of instruction weekly is \$60. The fee for more than one hour of instruction weekly—for music majors only—is \$60.

Musical Instrument Rental Charge. The charge for use of university-owned musical instruments is \$25. Consult the School of Music for specific information.

Binding and Microfilm Fees. The binding fee for a thesis or dissertation is \$17 per copy. This fee is subject to change. Additional charges may be required depending on the size and nature of the document. The dissertation microfilming fee is \$55 and is subject to change.

Sun Card/ID Card. The replacement fee is \$10.

Parking Decals. A parking decal must be purchased, in person or by using the Park Smart touch-tone telephone system 480/921-PARK (7275), for motor vehicles parked on campus except in areas where metered parking or visitor lots are available. Photo identification is required. Annual decals range from \$50 to \$129 for controlled access parking. Decals are sold on a first-come, first-served basis. For more decal sales information, call 480/965-6124, or visit the Web site at www.asu.edu/dps/pts.

Each vehicle registered at ASU Parking and Transit Services must comply with Arizona emission standards (A.R.S.

§ 15-1627G) during the entire registration period. The fee for this emission inspection is \$25 to \$35 per vehicle.

Everyone is encouraged to support travel reduction measures by using mass transit, the university shuttle bus, carpooling, bicycling, or walking whenever possible.

Parking Violations. Due to a high demand for parking, regulations are strictly enforced. Fines range from \$10 to \$100. Appeals to parking citations may be filed within 14 calendar days to Parking and Transit Services and, after payment, may be further appealed to the Parking Citation Appeals Board. Unpaid parking citations are delinquent financial obligations subject to the provisions of the "Delinquent Financial Obligations" section, page 46. The vehicle of any person owing three or more unpaid parking citations or \$100 in unpaid parking citations is subject to impoundment. An \$85 minimum fee is assessed if impoundment is required. For more information, call 480/965-4527.

Returned Checks. Checks returned by a bank are assessed a \$15 service charge with repayment needed within five business days of notification. A second \$12 service charge is made if the returned check is not repaid within this five-day period. Repayment of a returned check must typically be in cash.

The university may have arrangements with its bank to redeposit automatically for a second time checks for which there are insufficient funds. No service charge is assessed by ASU until a check is returned to ASU; however, the payer may be assessed a service charge by the payer's financial institution.

Students paying fees with a check that is subsequently not honored by a financial institution are subject to involuntary withdrawal from the university if repayment is not made. All students involuntarily withdrawn are charged according to the standard refund schedule as of the involuntary withdrawal date, as determined by the university.

On-Campus Housing. The cost of ASU Main housing varies. In 1999–2000 the typical cost was \$2,780 per academic year. Meal plans are purchased separately. For more information, see "Residential Life," page 36, or call 480/965-3515.

TRANSPORTATION

To reduce air pollution and traffic congestion, students are encouraged to travel to and from campus by means other than automobile and to reduce transportation needs through careful class scheduling. Nearby on-campus parking is limited and tightly controlled.

Alternative transportation modes are used by thousands of ASU students. ASU is served by a regional transit service; monthly and reduced-fare semester passes are available on campus. In addition, an inexpensive express shuttle runs between ASU Main in Tempe and ASU West in northwest Phoenix; another shuttle runs among ASU Main, Mesa Community College, and ASU East in Mesa; and a Free Local Area Shuttle (FLASH) is available around the periphery of ASU Main.

Bicycle ridership at ASU is estimated to be more than 15,000 students daily. Ample racks in many locations enable the parking and securing of bicycles. Bicycle use is restricted only in those areas of campus where pedestrian traffic is sufficiently heavy to make such use a hazard. The

Bike Co-op Repair Service provides assistance with bicycle maintenance.

For more information on commute alternatives, call 480/965-1072.

PAYMENT METHODS AND DEADLINES

InTouch. The InTouch system, at 480/350-1500, allows students to register for classes, to drop and add classes, and to make fee payment from any touch-tone phone. Students paying fees with available financial aid, debit cards, Visa, MasterCard, or Discover must use the InTouch system. Refer to the *Schedule of Classes* for available dates and times and more information about the InTouch system.

Debit/Credit Cards. ASU accepts debit cards, Visa, MasterCard, and Discover. Debit/credit card payments through InTouch are processed online with the bank. See the *Schedule of Classes* for information about using debit/credit cards by mail or campus payment boxes.

Checks. Checks payable for the exact amount of charges and without a restrictive endorsement are generally acceptable, except for students on check-use suspension due to a previously returned check.

Financial Aid. Students receiving financial aid may use their expected aid, except Federal Work-Study, to pay university charges, including fees. Students who wish to do so must follow specified procedures. See the latest *Schedule of Classes* for more information.

Veterans Deferred Payment. The Veterans Readjustment Assistance Act allows veterans to apply for deferred payment of fees, books, materials, and supplies required for courses. To assist eligible students, a Veteran Promissory Note may be issued deferring payment during their first semester of benefits. Contact the Veterans Services Section at SSV 148, or call 480/965-7723 for information on meeting the necessary requirements. The university may deny this privilege with previous delinquent obligations.

Payment Deadlines. Fees must be paid by the deadline dates and times indicated or the registration is voided. A fee payment deadline is printed on all Schedule/Billing Statements and in the *Schedule of Classes*.

REFUNDS

Academic Year Resident and Nonresident Tuition. Students withdrawing from school or individual classes receive a refund as described in the “Fall and Spring Withdrawal Refunds” table:

Fall and Spring Withdrawal Refunds	
Withdrawal Date	Refund
Before first day of the semester	100% *
One through 7 calendar days	80%
8 through 14 calendar days	60%
15 through 21 calendar days	40%
22 through 28 calendar days	20%
After the 28th calendar day	No refund

* A \$35 processing fee is subtracted per session.

The university provides a prorated refund for first-time students receiving financial aid; therefore, the refund schedule is the minimum amount refundable to these students.

Withdrawal occurs on the calendar day that withdrawal is requested, either in person at a registrar site or by phone using InTouch. Students withdrawing for medical or other extenuating circumstances must contact their college for refunds that may be available under these circumstances.

Summer Sessions Fees. Students withdrawing from any summer session or individual classes receive a refund as described in the “Summer Sessions Withdrawal Refunds” table. *Refunds are based on the session days and not the class meeting dates for any particular class.*

Summer Sessions Withdrawal Refunds

Withdrawal Date	Refund
Before first day of session	100% *
First and second days of session	80%
Third day of session	60%
Fourth day of session	40%
Fifth day of session	20%
After fifth day of session	No refund

* A \$35 processing fee is subtracted per session.

Special Class Fees and Deposits. After the first week of classes, refunds, if any, are determined only by the department or school offering the course. Refund determination is based on withdrawal date, type of activity, and costs already assessed by the department or school.

Private Music Instruction. If a student must drop a music course because of illness or other emergency beyond the student’s control, not more than half of the instruction charge may be refunded, as determined by the School of Music.

Late Registration. This fee is not refundable.

Student Recreation Complex Fee. This fee is refundable only upon complete withdrawal, in percentage increments per the refund schedule.

Financial Aid Trust Fee. This fee is not refundable.

Official Transcripts. Overpayments by mail of \$5 or less are refunded only by specific request.

Graduation Fee. Overpayments by mail of \$5 or less are refunded only by specific request.

Residence Halls. Refunds to students departing from ASU Main residence halls before the end of the academic year are computed on the following basis.

Charges and Deposits. Housing payments and deposits are refunded as prescribed by the Residential Life License Agreement that students sign when they apply for residence hall accommodations. Students should refer to the Residential Life Schedule of Charges and Deadlines for specific information on refunds.

Other University Charges. Other university charges are normally not refundable, except for individual circumstances.

Payment of Refunds. Refunds require student identification and are made payable only to the student for the net amounts due the university. When the last day of a refund period falls on a weekend or holiday, a withdrawal form must be submitted to one of the registrar sites during operating hours on the workday preceding the weekend or holiday. Refunds are normally paid by check, payable to the student, and are mailed to the student's local address.

Parking Decal Refunds. Prorated refunds are available through the last business day in April.

Forfeiture of Refunds. Refunds are subject to forfeiture unless obtained within 90 days of the last class day of the semester for which the fees were originally paid.

DELINQUENT FINANCIAL OBLIGATIONS

Arizona Board of Regents' Policy 4-103B, which applies to ASU, states the following:

1. Each university shall establish procedures to collect outstanding obligations owed by students and former students.
2. Each university shall maintain a system to record all delinquent financial obligations owed to that university by students and former students.
3. Students with delinquent obligations shall not be allowed to register for classes, purchase parking decals, receive cash refunds, or obtain transcripts, diplomas, or certificates of program completion. The university may allow students to register for classes, obtain transcripts, diplomas, or certificates of program completion if the delinquent obligation is \$25 or less.
4. Unpaid obligations shall remain a matter of record until students and former students satisfy their financial obligations or until satisfactory arrangements for repayment are made with the university.
5. The university may write off delinquent financial obligations of students according to accepted accounting principles and after appropriate collection efforts. No such write-off shall operate to relieve the student of liability for the obligation nor shall such write-off entitle the student to release of any transcripts, diplomas, certificates of program completion, or to register for further university classes until such obligation is actually paid.
6. Each university shall include this policy in its bulletin or catalog.

A late charge of \$12 is assessed for any balances due the university not paid within 30 days of the initial due date, with a second \$12 late charge assessed if these amounts are not paid within 30 days of the first late charge, and a third \$12 late charge is assessed if these charges are not paid within 60 days of the first late charge. Procedures to be followed for disputed charges are available from the Accounts Receivable section of Student Business Services, located in ADM A109.

RESIDENCY CLASSIFICATION PROCEDURES AND POLICIES

The Arizona Board of Regents is required by law to establish uniform guidelines and criteria for classifying stu-

dents' residency to determine those students who must pay nonresident tuition. The following is a summary of the general guidelines used to determine residency for tuition purposes. All of the evidence is weighed under the presumption that a nonresident student's presence in Arizona is primarily for the purpose of education and not to establish domicile and that decisions of an individual about the intent to establish domicile are generally made after the completion of an education and not before.

To obtain resident status for tuition purposes, independent students must establish their residence in Arizona at least one year immediately before the last day of regular registration for the semester in which they propose to attend ASU. Arizona residence is generally established when individuals are physically present in the state with the intention of making Arizona their permanent home.

Mere physical presence in Arizona for one year does not automatically establish residency for tuition purposes. Adult students and emancipated minors must combine physical presence in Arizona for one year with objective evidence of their intent to make Arizona their permanent home. If these steps are delayed, the one-year period is extended until both presence and intent have been demonstrated for one full year. In addition to physical presence and intent, the student must demonstrate financial independence for the two tax years immediately preceding the request for resident classification. The student must demonstrate objective evidence of self-support and that he or she was not claimed as an income tax deduction by his or her parents or any other individual for two years. An adult student is defined as being at least 18 years of age at the beginning of the domicile year. For a complete definition of an emancipated minor, refer to the Arizona Board of Regents' residency classification policies, available in the Residency Classification Section, SSV 146.

No person is considered to have gained or lost resident status merely by attending an out-of-state educational institution.

Aliens. Students who are aliens are subject to the same requirements for resident status as are U.S. citizens. In establishing domicile, aliens must not hold a visa that prohibits establishing domicile in Arizona.

Refugees. Refugees may qualify as resident students by virtue of having been granted refugee status in accordance with all applicable laws of the United States and having met all other requirements for residence in Arizona.

Exceptions to the General Residency Rule

Students may be eligible for resident status for tuition purposes if they can meet one of the following criteria on or before the last day of regular registration.

Legal Dependents. If a student and his or her parents are domiciled in Arizona and have not met the one-year residency requirement but the parents are entitled to claim the student as a dependent for federal and state tax purposes, the student may be eligible for resident status for tuition purposes.

Transferred Employees. If students are domiciled in Arizona and have not met the one-year residency requirement but are employees or spouses of employees who have been transferred to Arizona by their employers for employment

purposes, the students may be eligible for resident status for tuition purposes.

Members of the Military. If students are not domiciled in Arizona but are members of the U.S. Armed Forces stationed in Arizona or are the spouses or dependent children of a member (as defined in A.R.S. § 43-1001), the students may be eligible for resident status for tuition purposes. If military service is concluded while they are enrolled, students do not lose resident status while they are continuously enrolled in a degree program. If individuals are domiciled in Arizona immediately before becoming members of the U.S. Armed Forces, they do not lose resident status because of their absence while on active duty with the military as long as they maintain Arizona affiliations and file Arizona state tax.

A student who is a member of an Arizona National Guard or Arizona Reserve unit may be eligible for resident status for tuition purposes. A student may also be eligible if he or she has been honorably discharged from the armed forces of the United States, has declared Arizona as his or her legal residence one year before discharge, and has taken the other appropriate actions, including filing an Arizona income tax return. A student who is the spouse or dependent of a member of the armed forces who has claimed Arizona as his or her legal residence and filed Arizona income tax for one year before enrollment may be eligible for resident status for tuition purposes.

Teachers and Classroom Aides. If a student is under contract to teach on a full-time basis or is employed as a full-time non-certified classroom aide at a school within a school district, the student is eligible to pay resident tuition only for courses necessary to complete the requirements for certification by the State Board of Education.

Native Americans. Students who are members of a Native American tribe whose reservation lies both in Arizona and

an adjacent state and who are residents of that reservation may be eligible for resident status for tuition purposes.

Procedures for Establishing Resident Status

All students are responsible for obtaining residency classification for tuition purposes before registering and paying their fees. This procedure requires students to complete and file a domicile affidavit form. This form is required of all new and returning students as part of the admission or readmission process. Students classified as nonresidents who believe they may qualify for resident status must file a petition with the Residency Classification Section. This petition must be filed by the last day of regular registration. A student seeking resident status must also file supporting documentation necessary to provide a basis for residency classification (source[s] of support, driver's license, voter's registration, vehicle registration, etc.). Students whose residency petitions are in process at the fee payment deadline are responsible for paying nonresident tuition. However, an appropriate refund is issued if resident status is later granted for that semester.

Any student found to have made a false or misleading statement concerning resident status is subject to dismissal from the university.

Failure to file a timely written petition for reclassification of resident status for tuition purposes constitutes a waiver of the student's right to apply for the given semester. Petition deadlines are published each semester in the *Schedule of Classes*. Extensions to the deadlines are not permitted.

Residency classification is an extremely complex issue. The information presented here is a summary and does not address each individual's situation; therefore, students are encouraged to make a personal visit to the Residency Classification Section to discuss their individual circumstances as soon as possible. Guidelines for determination of residency for tuition purposes are subject to review and change without notice. For more information, call the Residency Classification Section at 480/965-7712, or access the Web site at www.asu.edu/registrar/residency.



Orange Mall

Jean Laaninen photo

Financial Aid

The primary responsibility for financing a college education belongs to students and their families (see the “2000–2001 Typical Student Budgets” table, page 49). The Student Financial Assistance Office helps students, within the limits of available funds, meet college costs. Students must complete all applications in an accurate and timely manner and notify Student Financial Assistance of any changes in circumstances that may affect eligibility (e.g., loss of parent’s income or change in residency classification). Financial assistance is available as scholarships, grants, loans, and employment. This aid has been made available collectively by the university, alumni, private foundations, civic groups, individuals, and state and federal governments.

To be considered for financial aid, all students must complete the Free Application for Federal Student Aid (FAFSA). This application should be completed in January or early February preceding the academic year the student anticipates attending ASU. The priority date for applying is February 15. Applications completed after this date are processed; however, they are considered late applications. Late applications are less likely to receive federal work-study, grants, and scholarships due to funding limitations.

An Application Acknowledgement is sent to all applicants. This letter may indicate any additional information needed to complete applications, such as copies of federal tax returns, proof of valid visa, and proof of registration with the Selective Service. Students will receive a Financial Aid Notification letter once their file is complete. This letter informs them of the types and amounts of aid they are eligible to receive. Applicants should read carefully all correspondence received.

Students receiving aid are required to meet minimum standards of satisfactory academic progress. In addition to maintaining the minimum GPA defined for good academic standing, undergraduate students must complete the hours for which they are funded during the academic year. Failure to meet these standards results in the suspension of aid funds for subsequent semesters until the deficiency is satisfied.

Students can access personal information regarding financial aid through the Financial Aid Services Through Technology (FASTT) phone system at 480/968-4400 or on the FASTT Web site at www.asu.edu/fastt. Students can access the following information:

1. documents still needed to complete a financial aid file;
2. award information; and
3. financial aid forms for printing.

TYPES OF FINANCIAL AID AND MAJOR PROGRAMS

More than 42,000 students receive financial aid resources that total more than \$255 million. There are four categories of financial aid: scholarships, grants, loans, and employment.

Scholarships

There are two sources of scholarships at ASU: university-funded scholarships and private donor scholarships. Many scholarships are offered on the basis of academic merit. However, financial need criteria may also be included in the selection of recipients. Other considerations are GPA, leadership qualities, and community service.

The Scholarship Office coordinates all scholarship programs. High school students should contact their high school counselors to determine the appropriate process for obtaining a variety of scholarships available to entering freshmen. Other undergraduate students may contact the Scholarship Office. In addition, many academic units provide scholarship funding and select students based on a variety of criteria, which include artistic talent, musical ability, and athletic performance.

Scholarship Tax Credits. Students may be eligible for either the Hope Scholarship or the Lifetime Learning tax credits. Additional information about these tax credits is available on the Web at sbs.asu.edu.

Consult a personal tax advisor about qualifications for the Hope Scholarship and Lifetime Learning tax credits.

Private Donor Scholarships. Most of these scholarship funds are provided by employers, private individuals, organizations, and corporations. In most cases, the private donor specifies the criteria used by the Scholarship Office to identify candidates for a particular scholarship.

University Scholarships. These scholarships are generally in the value of tuition and/or fees. The largest source for university scholarships is the waiver program authorized by the Arizona Board of Regents. In addition, many scholarships are funded from a general endowment fund. Some of the typical areas targeted for these scholarships are top academic seniors in Arizona high schools, students who demonstrate leadership, students who demonstrate scholastic or scientific abilities, students with disabilities, and nontraditional students.

Grants

Like scholarships, grants are provided to students without repayment or service obligation. However, grants are generally calculated based on financial need. Students must complete the FAFSA.

Federal Pell Grant. Funded by the federal government, the Pell Grant is awarded to students who demonstrate significant financial need. Pell Grant eligibility is determined by the U.S. Department of Education. All students are informed of their eligibility for the grant through the Student Aid Report. The maximum award for the 2000–2001 academic year was \$3,300.

Federal Supplemental Educational Opportunity Grant. SEOG is a federally funded, campus-based program. A limited amount of funds is available through the program. The amount received will depend upon a student’s financial need, the amount of other assistance awarded, and the avail-

2000–2001 Typical Student Budgets

Item	Dependent			Independent	
	At-Home	On-Campus	Off-Campus	On-Campus	Off-Campus
Room	\$ 1,000	\$ 3,240	\$ 3,900	\$ 3,700	\$ 4,950
Board	1,000	2,000	2,000	2,000	2,000
Personal/Miscellaneous	1,992	1,992	1,992	2,592	2,592
Transportation	1,000	1,000	1,000	1,200	1,200
Total living ¹	\$ 4,992	\$ 8,232	\$ 8,892	\$ 9,492	\$ 10,742
Resident tuition	\$ 2,272	\$ 2,272	\$ 2,272	\$ 2,272	\$ 2,272
Special fees	74	74	74	74	74
Books/supplies	700	700	700	700	700
Resident total	\$ 8,038	\$ 11,278	\$ 11,938	\$ 12,538	\$ 13,788
Additional tuition for nonresidents ²	\$ 7,456	\$ 7,456	\$ 7,456	\$ 7,456	\$ 7,456
Nonresident total	\$ 15,494	\$ 18,734	\$ 19,394	\$ 19,994	\$ 21,244

¹ Loan fees are not included in this amount.

² Amounts of nonresident tuition are shown in the “2000–2001 Resident and Nonresident Tuition” table, page 43.

ability of funds. Maximum grant awards for 2000–2001 were \$1,000.

Leveraging Educational Assistance Partnership (LEAP).

This program is a three-partner program of federal, state, and university funding. Students with a high financial need may receive this particular form of funding. It is restricted to residents of Arizona. The maximum grant for 2000–2001 was \$1,250.

Student Aid Trust Grant. Provided in partnership between ASU students and the state legislature, these funds are provided primarily to resident and undergraduate students with a high financial need. The maximum grant for 2000–2001 was \$1,500.

University Grant. University grants are generally reserved as the last grant program to be used to resolve a student’s need. Funded by the university, grants are available for both resident and non-resident students. The maximum grant awards for 2000–2001 were \$2,000.

Loans

A variety of loan programs provide assistance to students and, in some cases, parents in the financing of a college education.

William D. Ford Direct Student Loan. Through the William D. Ford Direct Student Loan program, the federal government loans money to students based on the university’s determination of the student’s financial need and cost of education. Repayment begins after the student graduates, leaves school, or drops below half-time enrollment. Under this program there are two loan types: subsidized and unsubsidized. With a subsidized Direct Student Loan, the federal government pays the interest on the loan principal during the student’s in-school status, grace, and other authorized periods of deferment.

The school may determine the student to have eligibility for an unsubsidized Direct Student Loan. In this program, the federal government does not pay the interest during the

student’s in-school status, grace, or other authorized periods of deferment. As the student proceeds through school, interest will accrue and will be added once the student enters repayment. Otherwise, conditions and terms for the two programs are the same.

There is a variable interest rate that is adjusted every July 1. Interest cannot exceed 8.25 percent. The federal government provides several options for repayment once the student has left school. For students who are considered dependent based on their financial aid application, the following total annual loan limits for subsidized and unsubsidized apply: freshmen may borrow up to \$2,625 per year; sophomores, up to \$3,500 per year; and juniors and seniors, up to \$5,500 per year. For students who are considered independent, the following annual loan limits apply: freshmen may borrow up to \$6,625, of which only \$2,625 can be subsidized; sophomores, up to \$7,500, of which only \$3,500 can be subsidized; and juniors and seniors, up to \$10,500, of which only \$5,500 can be subsidized.

Federal Perkins Loan. The Federal Perkins Loan program is funded by the federal government; the school is the actual lender, and repayments after graduation are made to the university at a 5 percent interest rate. Like the subsidized Student Loan, no interest accrues on the Perkins Loan during the enrollment period. If funding is available, deferment and cancellation provisions may apply to graduates working in community service, qualifying law enforcement, and teaching occupations. Maximum awards for 2000–2001 were \$3,000.

Parent Loan for Undergraduate Students. Under the Parent Loan for Undergraduate Students (PLUS), parents may borrow money from the federal government on behalf of their dependent students. With this loan, interest is not deferred and repayment begins 60 days after disbursement of the loan to the parent. The PLUS approval is based on the parents’ credit history. If parents are determined ineligible for a PLUS and students need additional funds, they should contact the Student Financial Assistance office to determine

their eligibility for an unsubsidized Direct Student Loan. There is a variable interest rate adjusted every July 1 that cannot exceed 9 percent. The maximum loan amount is determined by subtracting all other financial aid from the student's cost of education.

Employment

The Student Employment Office provides employment opportunities to students who must work to meet educational expenses or who wish to work because they feel the experience can be a valuable part of their education. Students may choose between hourly and Federal Work-Study programs. The Federal Work-Study programs include community service opportunities.

Federal Work-Study. Funds for this program are provided on a matching basis by the federal government and the university. Students employed under this program receive the same pay rates as other students being employed on campus. In this program, students must demonstrate a financial need.

University Hourly. The university, with its own resources, hires many students on a part-time basis. Although the jobs are similar to those under the Federal Work-Study Program, the university provides the entire amount of the student's wage.

Part-Time Off-Campus. The university receives requests for assistance from many agencies and corporations

throughout the area to help them recruit and hire students on a part-time basis. The referral service at the university provides opportunities for students not only to earn funds to support their education, but to gain experience in the areas of their majors or career interests.

Taxability of Financial Aid Programs

Scholarships, grants, fellowships, and stipends (but not loan funds) are taxable income to the recipient, except for the portion of these funds used for tuition, registration, and other university fees, or books, supplies, and equipment required for the courses being taken. Special tax regulations also apply to nonresident alien students and may require withholding of taxes at the time of aid disbursements to these individuals. Information on the taxability of scholarships can be obtained from the following Internal Revenue Service (IRS) publications and forms: *Publication 4—Student's Guide to Federal Income Tax*; *Publication 519—U.S. Tax Guide for Aliens*; *Publication 520—Scholarships and Fellowships*; Form 1040EZ and Instructions—Income Tax Return for Single and Joint Filers with no dependents; and Form 1040NR and Instructions—U.S. Nonresident Alien Income Tax Return.

These publications and forms can be obtained from the IRS at its toll-free number 1-800-829-FORM (3676). These publications and forms can also be accessed online at www.irs.ustreas.gov/prod/forms_pubs.



The Arboretum at ASU features more than 300 diverse species and varieties of trees and plants.

Jean Laaninen photo

Classification of Courses

COURSE INFORMATION

Information about all lower- and upper-division courses offered at ASU Main and ASU East appears in the *General Catalog*, available on the Web at www.asu.edu/aad/catalogs. Course information at this Web site is more current than in the printed catalog.

ASU Main and ASU East graduate-level courses are described in the *Graduate Catalog*.

ASU West courses are described in the *ASU West Catalog*.

Classes scheduled for the current or upcoming fall or spring semester are listed in the *Schedule of Classes*. Classes scheduled for the summer sessions are listed in the *Summer Sessions Bulletin*. Class schedules are available on the Web at www.asu.edu/registrar/schedule.

COURSE LISTINGS

See “Course Prefix Index,” page 6, for the location of all ASU courses by prefix. See the “Key to Course Listings” diagram, on this page, for help in understanding listings.

Campus Code. Campus codes are used in the *General Catalog* and *Graduate Catalog* only for courses in prefixes used by both ASU East and ASU Main. Campus codes are used for all courses offered at ASU Main (M), ASU East (E), and ASU West (W) in the *Schedule of Classes* and the *Summer Sessions Bulletin*.

Semester Offered. In the *General Catalog* and *Graduate Catalog*, the semester offered shows when the academic unit plans to offer the course. Refer to the *Schedule of Classes* and the *Summer Sessions Bulletin* for the actual course offerings.

Prerequisites and Corequisites. Some requirements, known as prerequisites, must be met *before* registering for a course. Other requirements, called corequisites, must be met *while* taking a course. A student registering for a course should be able to show that prerequisites have been met and that corequisites will be met as stated in the catalog or *Schedule of Classes* or must otherwise satisfy the instructor that equivalent preparation has been completed.

General Studies Code. See “General Studies,” page 78, for an explanation of the General Studies requirement, which applies to students pursuing a bachelor’s degree.

COURSE NUMBERING SYSTEM

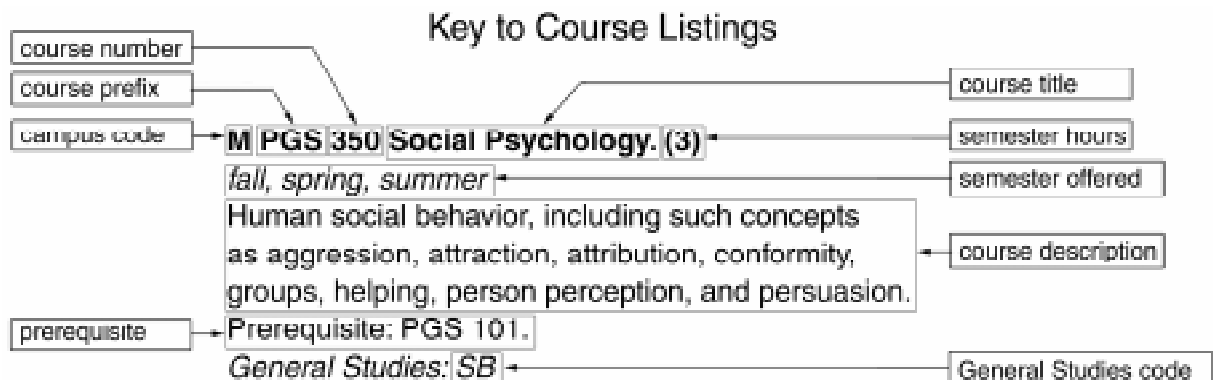
100–299 (Lower-Division) Courses. Lower-division courses are designed primarily for freshmen and sophomores. Certain classes are closed to freshmen who lack the designated prerequisites or whose majors are outside the unit offering the course. This information is available in the *General Catalog*, in the *Schedule of Classes*, or from the student’s academic advisor.

300–499 (Upper-Division) Courses. Upper-division courses are designed primarily for juniors, seniors, and other advanced students. Prerequisites and other restrictions should be noted before registration. Courses at the 400 level apply to graduate degree requirements for some graduate programs when approved by the Graduate College.

500–799 (Graduate-Level) Courses. Graduate-level courses are designed for graduate students. However, an upper-division undergraduate student may enroll in these courses with the approval of the student’s advisor, the course instructor, the department chair, and the dean of the college in which the course is offered. If the course does not meet an undergraduate graduation requirement, it may be eligible for use in a future graduate program on the same basis as work taken by a nondegree graduate student. See “Reserving of Course Credit by Undergraduates,” page 66.

Omnibus Courses

Omnibus numbers are used for courses offered on an experimental or tutorial basis or for courses in which the content is new or periodically changes. Academic units use their prefixes with omnibus course numbers. The general nature of the work required for a particular omnibus course is consistent from unit to unit, but subject matter varies. Omnibus courses are often offered for a variable number of semester hours. See the appropriate academic unit in the *General Catalog* or major in the *Graduate Catalog* for omnibus courses.



OMNIBUS UNDERGRADUATE COURSES

191 First-Year Seminar. (1–3)

Small course emphasizing student-faculty discussion/interaction. Strongly recommended for first-year students. Must have taken 25 or fewer semester hours. Consulting an academic advisor before enrolling is recommended.

194, 294, 394, 494 Special Topics. (1–4)

Covers topics of immediate or special interest to a faculty member and students.

484 Internship. (1–12)

Structured practical experience following a contract or plan, supervised by faculty and practitioners.

498 Pro-Seminar. (1–7)

Small-group study and research for advanced students within their majors. Major status in the department or instructor approval is required.

499 Individualized Instruction. (1–3)

Provides an opportunity for original study or investigation in the major or field of specialization on an individual and more autonomous basis. Neither a substitute for a catalog course nor a means of taking a catalog course on an individual basis. Requires application well in advance of regular registration with the student's advisor, the advisor's signature, and approval by both the instructor with whom the student will work and the chair of the department offering the course. This course may be taken only by outstanding senior students who have completed at least one semester in residence and who have a cumulative GPA of 3.00 or higher in the major or field of specialization. A special class fee may be required.

First-Year Seminar. The First-Year Seminar series is specifically designed to meet the needs of the first-year student. Faculty volunteer to direct the seminars and choose course topics according to their own interests and areas of specialization. Class size is restricted so that, early in their college careers, students may interact directly with some of the best faculty the university has to offer.

Honors Courses. The courses listed as 298 and 492 Honors Directed Study, 493 Honors Thesis, 497 Honors Colloquium, and all courses with the HON prefix are reserved for students in the Barrett Honors College. These courses range from one to six semester hours. Consulting with an honors advisor before enrolling is recommended.

OMNIBUS GRADUATE COURSES

500, 600, 700 Research Methods. (1–12)

Course on research methods in a specific discipline.

580, 680, 780 Practicum. (1–12)

Structured practical experience in a professional program, supervised by a practitioner and/or faculty member with whom the student works closely.

583, 683, 783 Field Work. (1–12)

Structured, supervised field experience in a field science or other discipline requiring experience in field techniques.

584, 684, 784 Internship. (1–12)

Structured practical experience following a contract or plan, supervised by faculty and practitioners.

590, 690, 790 Reading and Conference. (1–12)

Independent study in which a student meets regularly with a faculty member to discuss assignments. Course may include such assignments as intensive reading in a specialized area, writing synthesis of literature on a specified topic, writing literature review of a topic.

591, 691, 791 Seminar. (1–12)

A small class emphasizing discussion, presentations by students, and written research papers.

592, 692 Research. (1–12)

Independent study in which a student, under supervision of a faculty member, conducts research that is expected to lead to a specific project such as a thesis or dissertation, report, or publication. Assignments might include data collection, experimental work, data analysis, or preparation of a manuscript.

593, 693, 793 Applied Project. (1–12)

Preparation of a supervised applied project that is a graduation requirement in some professional majors.

594 Conference and Workshop. (1–12)

Topical instruction, usually in compressed format, leading to academic credit. Often offered off campus to groups of professionals.

595, 695, 795 Continuing Registration. (1)

Used in situations where registration is necessary but where credit is not needed. Replaces arbitrary enrollment in reading and conference, research, thesis, dissertation, etc. Used by students when taking comprehensive examinations, defending thesis or dissertation, or fulfilling the continuous enrollment requirement in doctoral programs. Credit is not awarded, and no grade is assigned.

598 Special Topics. (1–4)

Topical courses not offered in regular course rotation—e.g., new courses not in the catalog, courses by visiting faculty, courses on timely topics, highly specialized courses responding to unique student demand.

599 Thesis. (1–12)

Supervised research focused on preparation of thesis, including literature review, research, data collection and analysis, and writing.

792 Research. (1–15)

Independent study in which a student, under supervision of a faculty member, conducts research that is expected to lead to a specific project such as a dissertation, report, or publication. Assignments might include data collection, experimental work, data analysis, or preparation of a manuscript.

799 Dissertation. (1–15)

Supervised research focused on preparation of dissertation, including literature review, research, data collection and analysis, and writing.

The preceding courses are described in announcements of the Graduate College and are also available in the respective departments. Under special circumstances, arrangements may be made at the dean's request, through the approval of the senior vice president and provost, to increase the standard semester hours of credit.

Continuing Registration. Courses numbered 595, 695, and 795, Continuing Registration, carry one semester hour of credit; however, the student receives neither credit nor grade for the course.

Visiting Student Program. The numbers 597, 697, and 797 in the LAW prefix have been reserved for the Visiting Student Program in the College of Law.

Elementary Education Program Courses. Some elementary education methodology courses use the prefix EDB for purposes of registration. These courses are reserved for students admitted to professional programs. EDB courses are converted to permanent ASU education courses (with other prefixes) following the drop-add period, as determined by the registrar's calendar.

Graduate College Courses. Courses with the prefix GRD numbered 791 are reserved for doctoral students participating in the Preparing Future Faculty (PFF) program administered by the Graduate College. PFF students are required to take one semester hour for each of the semesters they are enrolled in the program. Students enroll for the first-year exploratory phase. Those accepted into the second-year participatory phase enroll for one semester hour each semester.

International Program Courses. Courses with the prefix IPO numbered 495 and 595 are reserved for International Programs study abroad and exchange programs. For most programs, participating students register for 18 semester hours. Following completion of an international program, undergraduate students receive credit for the study completed, with a minimum of 12 semester hours and a maxi-

mum of 18 semester hours, graduates with a minimum of six semester hours and a maximum of 12 semester hours.

IPO courses numbered 495 and 595 are converted to ASU credit for recording courses taken abroad.

IPO courses numbered 494 and 598 may be taken for one semester hour. Students register for these courses under the

title "Study Abroad." At the conclusion of the program and the transfer of overseas courses to the students' ASU records, a grade of "Y" is entered for the course.

For some special international programs, students register and receive credit for fewer semester hours.



Gabe Gerbic enjoys a workout.

Undergraduate Enrollment

Arizona State University shares with other colleges and universities a tradition of service and academic excellence that is hundreds of years old. Its purpose is the exchange of knowledge and the pursuit of wisdom. What makes this university special is its commitment to providing a setting where faculty and students are challenged to exchange ideas and information within an atmosphere of intellectual honesty.

The university offers its students unique opportunities to enjoy both a rich cultural heritage and a diverse student population. Anyone giving evidence of suitable preparation, by way of acceptable academic credentials, is welcome to the university without regard to race, religious creed, or national origin.

Under the constitution and the laws of the State of Arizona, jurisdiction over ASU has been vested in the Arizona Board of Regents. The regents, in turn, grant broad legal authority to the president, the administration, and the faculty to regulate student life within reasonable limits.

By enrolling, a student voluntarily assumes certain obligations of conduct and performance. These obligations include acting with honesty, integrity, and fairness in all campus and community activities. They also include avoiding certain behaviors, such as: the irresponsible use of alcohol; the use, possession, or distribution of illegal drugs; and verbal or physical assaults. Should a student advertently or inadvertently become involved in questionable campus-related actions or activities, the university will investigate the circumstances and will enforce its standards of conduct through prescribed procedures contained in the *Student Code of Conduct*.

The primary purpose for the *Student Code of Conduct* is to set forth the standards of conduct expected of students who choose to join the university community. Students and student organizations are expected to become familiar with and adhere to this code. Violations of the *Student Code of Conduct* will result in university disciplinary action being taken and appropriate sanctions being imposed for the misconduct. Copies of the *Student Code of Conduct* are available in the Office of Student Life, SSV 263.

The university further reserves the right to take necessary and appropriate action to protect the safety and welfare of the campus community and will cooperate with appropriate law enforcement agencies in their efforts to ensure a safe and secure environment.

STUDENT SERVICES AT ASU

Arizona State University is a richly diverse academic setting with more than 49,000 students. The ASU student may be a traditional 18- to 24-year-old, a recent high school graduate, a community college transfer, someone returning to college to pursue a degree, or a professional studying for an advanced degree or career change. The ASU student may live in residence halls, in on-campus housing for sororities or fraternities, or in one of the many communities in the metropolitan Phoenix area. Each of the 50 states and more than 100 countries have students enrolled at ASU.

The university is organized into several distinct administrative areas. Student Affairs, one of these areas, is responsible for the delivery of a variety of services and developmental programs in support of students' educational pursuits. These programs and services are based upon human development research that advocates that a person develop culturally, emotionally, intellectually, morally, physically, psychologically, socially, and spiritually.

Special attention is given not only to the recruitment of a high-achieving, culturally diverse student body, but to the creation of an energetic campus environment that both catalyzes mature development and advances the academic endeavors of students.

Enrollment services to students begin with recruitment, admissions, student financial assistance, on-campus housing, and registration programs. Student Affairs encourages students to explore the facilities, services, and human resources available. ASU Main departments guiding students in their educational experience include Career Services, Counseling and Consultation, the Memorial Union, Recreational Sports, Residential Life, Student Development, the Student Health and Wellness Center, Student Life, and Student Media. Each of these areas provides specialized learning opportunities, contributing to an environment that fosters both personal and academic growth.

Undergraduate Admission

Arizona State University welcomes application for admission from anyone seeking to benefit from the university's broad spectrum of educational programs and services.

For information and application materials, prospective students may call 480/965-7788, access the Web site at www.asu.edu/admissions, or write

UNDERGRADUATE ADMISSIONS
ARIZONA STATE UNIVERSITY
PO BOX 870112
TEMPE AZ 85287-0112

With reasonable advance notice, Undergraduate Admissions arranges for a tour of ASU Main, a university information session, a classroom visit, and, if desired, a meeting with an admissions counselor. For more information, call 480/727-7013.

Requests for specific information relating to academic programs or student services should be addressed to the appropriate department, school, division, or college.

Admission Procedures for Freshman and Transfer Applicants

Individuals interested in admission to an undergraduate program at ASU need to have the following items on file at Undergraduate Admissions (non-U.S. citizens should see "International Student Admissions," page 59, for additional requirements): the application, the fee, official transcripts, and test scores.

Application for Admission. Prospective students must complete and sign the Application for Undergraduate

Admission. Like other state-supported colleges and universities, ASU distinguishes between resident and nonresident students with regard to tuition. Residents of Arizona are required to provide residency information, which is part of the admission application. Any student who does not provide residency information is classified as a nonresident for tuition purposes. For more information, call the Residency Classification Office at 480/965-7712.

Students who are admitted for a specific semester and do not enroll must submit a new application (and application fee for nonresident applicants) if they wish to apply for a subsequent semester. All documents are destroyed one year after the semester for which the student has applied if the student is not enrolled in a degree program. Any misrepresentation or falsification on the admission application, including failure to report any college or university attendance, is cause for cancellation of enrollment and any credits earned.

Application Fee. All applicants applying as nonresidents or residing outside Arizona must submit a \$40 nonrefundable application fee.

Official Transcripts. Applicants are responsible for requesting transcripts from each education institution attended. Official transcripts must be *mailed directly to Undergraduate Admissions by the records office of the issuing institution(s)*. ASU does not accept transcripts sent or carried by hand by the applicants themselves or transmitted by facsimile (fax) machine. High school transcripts must show GPA, and date of graduation. ASU requires an English translation of all foreign language transcripts.

American College Test (ACT) or Scholastic Aptitude Test (SAT). See “Freshman Applicants,” on this page, to determine which test scores are needed. Undergraduate Admissions may investigate any test score that is inconsistent with a student’s academic record or previous scores.

A report of the test scores should be sent to Undergraduate Admissions directly from

AMERICAN COLLEGE TESTING PROGRAM
PO BOX 168
IOWA CITY IA 52243-0168

or the

COLLEGE BOARD ADMISSIONS TESTING PROGRAM
PO BOX 592-R
PRINCETON NJ 08542-0590

Application Time Line. ASU urges applicants to apply and to have their materials sent as soon as possible to enable university officials to make an early decision concerning the applicant’s admission and to permit the student to take part in preregistration and orientation. Applicants should allow four weeks after all necessary items are received for an admission decision to be made.

Early Notification Date. Applicants whose files are complete (all necessary documentation has been received) by November 1 receive notification by December 1. Applicants whose files are complete by December 1 receive notification by January 15.

Admission Before Receipt of Final Transcript. Admission may be granted to high school seniors who submit a

six-semester or seven-semester transcript that shows academic quality or rank in class in keeping with admission standards and who complete the steps in the undergraduate admission procedures. Admission is official when verification of high school graduation showing the final GPA and the date of graduation has been received in the mail by Undergraduate Admissions directly from the high school. Final transcripts must be received a minimum of 45 days in advance of the start of the semester. An admission may be canceled if the final verification shows that the applicant has not met the university requirements for admission or that more than two deficiencies remain.

Transfer applicants enrolled in other colleges and universities may be considered for admission on the basis of meeting all admissions requirements, except for a final transcript of work in progress. This final transcript must be sent to Undergraduate Admissions directly from the issuing institution immediately after the work in progress has been completed. Transcripts carried by hand are not accepted. *Admission is official only after the final transcript has been received showing that the applicant has met the university admission requirements.* In the event the applicant does not qualify or has falsified application documents, admission and registration are canceled, and any registration fees paid are returned.

Undergraduate Admission Standards

The Arizona Board of Regents establishes undergraduate admission standards for the university in general. *Particular colleges, divisions, schools, or departments within the university may establish stricter standards, which are given in the respective sections of the catalog and should be noted by students planning to enroll in any of these programs.*

Freshman Applicants

Undergraduate Admissions requires freshman applicants’ official high school records. To be eligible for admission to ASU, a freshman must have graduated from a recognized high school with satisfactory scholarship defined as meeting both the general aptitude and basic competency requirements shown in the “Basic Competency Requirements” table, page 56, and the “General Aptitude Requirements for Freshmen” table, page 57.

Applicants with a maximum of one deficiency in no more than two competency areas—provided the competency areas are not both math and science—may be admitted with conditions subject to removing the deficiencies within one calendar year of university enrollment. See “Meeting Basic Competencies,” page 71, for an explanation of procedures to meet these competencies.

If the applicant is unable to meet these specific admission requirements, it is possible to file a letter of appeal with the Undergraduate Admissions Board:

UNDERGRADUATE ADMISSIONS BOARD
ARIZONA STATE UNIVERSITY
PO BOX 870112
TEMPE AZ 85287-0112

The decision of the board is final and any conditions set by the board for future admission supersede all other admission criteria or exceptions. The applicant must be able to meet at least one of the following criteria to be considered for appeal:

Basic Competency Requirements

High School Courses	Test Scores	College Courses
English		
Four years high school: English composition/literature-based	<i>or</i> Minimum test score: ACT English—21 ¹ <i>or</i> SAT I verbal—530 (450) ²	<i>or</i> One transferable three-semester-hour college-level course in English composition
Fine Arts		
One unit of fine arts or a combination of two semesters of fine arts	<i>or</i> NA	<i>or</i> One transferable three-semester-hour fine arts course
Foreign Language		
Two years of the same foreign language	<i>or</i> NA	<i>or</i> One year of transferable college study in the same foreign language
Laboratory Science		
Three years high school, one each from three of the following: biology, chemistry, earth science, integrated sciences, and physics. An advanced-level course may be substituted for one subject area.	<i>or</i> Two years high school lab science (biology, chemistry, earth science, physics) plus minimum SAT II: subject test score on one of the following: ² Biology Achievement—590 (550) ² Chemistry Achievement—600 (575) ² Physics Achievement—620 (590) ² ACT Science Reasoning—20 The test score may not be from any subject from which high school credit was earned	<i>or</i> Three transferable four-semester-hour college-level lab science courses in different subject areas. An advanced-level course may be substituted for one subject area.
Mathematics		
Four years high school: one year Algebra I, one year Geometry, one year Algebra II, and one year advanced mathematics	<i>or</i> Minimum test score: ACT Math—24 ¹ <i>or</i> SAT I Math—540 (500) ²	<i>or</i> One transferable three-semester-hour course in mathematics for which Algebra II is a prerequisite
Social Science		
Complete both <i>A</i> and <i>B</i> .	<i>or</i> Minimum SAT II: subject test score on American History and Social Studies Achievement—560 (510) ²	<i>or</i> One transferable three-semester-hour college-level American history course
A. One year high school American history	Minimum SAT II: subject score on World History Achievement—580 (545) ²	One transferable three-semester-hour college-level social science course
B. One year high school social science (e.g., anthropology, European history, geography, government, world history)		

¹ The ACT scoring system has been modified. As a result, these scores are effective for tests taken in and after October of 1989. Equivalent scores for tests taken before October 1989 are 19 for English and 18 for math.

² The SAT scoring system has been modified. As a result, these recentered scores are effective for tests taken on or after April 1, 1995. Equivalent scores for tests taken before April 1995 are in parentheses.

1. an upward grade trend during the high school career or an upward grade trend during the senior year;
2. positive recommendations from secondary school administrators, faculty, or counselors based on considerations such as academic potential, work experience, and leadership ability;
3. an average score of 50 or greater on the General Education Development (GED) examination; or
4. completion of at least 12 semester hours of college freshman-level academic studies (at a community college or at a university or both) with a GPA of 2.50 or higher on a 4.00 = A scale in courses in English, social science, mathematics, physical or natural science, foreign languages, fine arts, or the humanities.

Transfer Applicants

Transfer applicants must submit official academic records from all colleges and universities attended. Transfer applicants under the age of 22 who have not completed an Arizona General Education Curriculum (AGEC) or associate's degree or higher must submit official high school records and meet basic competency requirements. Students who have not completed first-semester freshman composition from a regionally accredited institution must also submit official SAT or ACT test scores.

Arizona Applicants. An Arizona applicant for transfer admission must have a cumulative GPA of 2.00 (4.00 = A) or higher in all work undertaken at previous institutions of higher learning. A minimum of 24 college or university

General Aptitude Requirements for Freshmen

Residency Classification	Class Rank	Composite Score					
		ACT ¹	SAT ²	GPA (4.00 = A)			
Arizona residents ³	top quarter	<i>or</i>	22	<i>or</i>	1040	<i>or</i>	3.00 competency GPA ⁴
Nonresidents ⁵	top quarter	<i>or</i>	24	<i>or</i>	1110	<i>or</i>	3.00 competency GPA

¹ The ACT scoring system has been modified. As a result, these scores are effective for tests taken in and after October of 1989. Equivalent scores for tests taken before October 1989 are 21 for Arizona residents and 23 for nonresidents.
² The SAT scoring system has been modified. As a result, these recentered scores are effective for tests taken on or after April 1, 1995. Equivalent scores for tests taken before April 1995 are 930 for Arizona residents and 1010 for nonresidents.
³ Resident freshmen who carry a competency GPA from 2.50 to 2.99 or who rank in the top 26–50% of the graduating high school class may be admitted with conditions.
⁴ A GPA calculated on courses that are used to fulfill competency requirements.
⁵ All nonresident freshmen who believe they have had a strong high school background and who rank in the top 26–50% of their graduating classes or who carry a competency GPA from 2.50 to 2.99 may apply and are considered on a case-by-case basis. Based on the review, the applicants may be admitted with conditions, deferred until additional course work is completed, or denied.

transferable semester hours must have been earned to be considered a transfer applicant.

Arizona transfer applicants must have the respective minimum GPAs to be admitted to the professional programs in the following areas: computer science—2.50; construction—2.25; economics—2.50; engineering—2.50; and technology—2.25. Other academic units may have different GPA requirements to enroll in junior- or senior-level courses.

Nonresident Applicants. A non-Arizona applicant for transfer admission must have a cumulative GPA of 2.50 or higher on a 4.00 = A scale in all work undertaken at previous institutions of higher learning. Applicants who have at least a 2.00 on a 4.00 = A scale and who believe that they have a strong academic record are considered on a case-by-case basis.

Transfer Credit

Credit is awarded for traditional course work successfully completed at institutions of higher learning as indicated by ASU and the Arizona Board of Regents. *Whether the specific credits can be applied toward a degree depends on the requirements of the department, division, school, or college in which the student is enrolled.* There are several qualifications:

1. Transfer credit is not given for courses in which the lowest passing grade (“D”) or a failing grade was received.
2. While some courses successfully completed but evaluated on nontraditional grading systems (e.g., pass/fail) may be acceptable for transfer, colleges in the university may not accept such credits to fulfill graduation requirements.
3. Grades and honor points earned at other colleges and universities are considered for admission but are not included in computing the student’s cumulative GPA at ASU.

The following types of credits cannot be transferred to ASU:

1. credits awarded by postsecondary institutions in the United States that lack candidate status or accreditation by a regional accrediting association;

2. credits awarded by postsecondary institutions for life experience;
3. credits awarded by postsecondary institutions for courses taken at noncollegiate institutions (e.g., governmental agencies, corporations, industrial firms);
4. credits awarded by postsecondary institutions for noncredit courses, workshops, and seminars offered by other postsecondary institutions as part of continuing education programs; and
5. credit for active service or courses that were taken through the military.

Acceptable academic credits earned at other institutions that are based on a different unit of credit than the one prescribed by the Arizona Board of Regents are subject to conversion before being transferred to ASU. Once a transfer course equivalency is determined, it stands unless the student changes majors and the course is required by the new major.

Veterans Exception. By Arizona statute, no failing grades received by a veteran at an Arizona university or community college before military service may be considered when determining admissibility. This exception applies only to veterans who

1. are honorably discharged;
2. have served in the armed forces of the United States for a minimum of two years; and
3. have previously enrolled at a university or community college in Arizona.

Military service records must be submitted, including form DD 214.

Community Colleges. A maximum of 64 semester hours are accepted as lower-division credit when transferred from community, junior, or two-year colleges.

Students Attending Arizona Community Colleges. To determine the equivalency of courses offered by Arizona community colleges and courses offered at ASU, a student should refer to the *Course Applicability System* in consultation with an academic advisor. The *Course Applicability System* addresses only the acceptability of a course, not its applicability to any specific major, thus the need to consult

General Aptitude Requirements for College Transfers¹

Residency Classification	Transferable Semester Hours	GPA (4.00 = A)	Materials Required
Arizona residents	1–23	2.00 college GPA plus general aptitude requirements for freshman plus competency requirements	Application, college and high school transcripts, and ACT or SAT scores
	24 or more	2.00 college GPA plus competency requirements	Application, college and high school transcripts, and ACT or SAT scores
Nonresidents ²	1–23	2.50 college GPA plus general aptitude requirements for freshman plus competency requirements	Application, college and high school transcripts, and ACT or SAT scores
	24 or more	2.50 college GPA plus competency requirements	Application, college and high school transcripts, and ACT or SAT scores

¹ Students 22 years of age or older and students who have completed an AGEC, an associate's, or higher degree at the time of enrollment do not need to submit high school transcripts or test scores.

² All nonresident transfers who have earned a 2.00–2.49 cumulative GPA are encouraged to apply and are considered on a case-by-case basis. Based on the review, the applicants may be admitted with conditions, deferred until additional course work is completed, or denied.

with an advisor. Community college students who plan to transfer to ASU at the end of their first or second years are strongly advised to follow the ASU transfer guides when taking courses to meet the requirements of the curricula they select. ASU transfer guides are available at www.asu.edu/provost/articulation. Provided college attendance has been continuous, students are permitted to follow the degree requirements specified in the ASU catalog in effect at the time they began community college work. See “Guidelines for Determination of Catalog Year,” page 74.

Arizona General Education Curriculum (AGEC)

The Arizona public community colleges and universities have agreed upon a common structure for a general education core. This curriculum provides students attending any Arizona public community college with the opportunity to build a general education program that is transferable to any other state institution without loss of credit. This common agreement is called the Arizona General Education Curriculum (AGEC).

The AGEC is composed of 35 semester hours of lower-division general education course work in which a student may prepare for transfer.

The AGEC has three forms: AGEC-A, AGEC-B, and AGEC-S. Refer to www.abor.asu.edu/4_special_programs/atass/student/agec.html for a detailed description of each AGEC.

Community colleges are responsible for certifying completion of the AGEC on the official institutional transcripts.

Completion of the appropriate AGEC will fulfill university lower-division general education requirements of the baccalaureate degree with which the AGEC articulates but may not apply to degrees articulated with the Transfer Guide Pathway TG-XR. Students completing the AGEC will still be required to fulfill lower-division program requirements and prerequisites within their college and major/minor area of study. To complete a degree program most efficiently, students should select courses to meet the AGEC requirements that will also fulfill program requirements in the college and major they intend to pursue upon transfer.

Completion of any AGEC guarantees admission to the university provided that a GPA of 2.00 (for Arizona resi-

dents) or 2.50 (for nonresidents) has been achieved. AGEC completion, however, does not guarantee admission to any specific university program. Majors in the professional fields (e.g., architecture, engineering, business, fine/creative arts, or health professions) and sciences have significant prerequisites and/or program requirements that must be completed before a student may be admitted to upper-division course work. Community college students who are undecided about which of the universities they plan to attend or what program of study they intend to pursue are advised to explore educational options while they complete the AGEC. In all cases, students have the responsibility for selecting general education course work that is relevant to the requirements of their intended major and degree.

Students who complete both the AGEC and an approved associate's degree will be assigned junior-class standing by the state universities. Junior-class standing is based on the number of semester credits a student has earned and does not necessarily indicate the remaining number of semester credits needed to complete degree requirements. Course prerequisites, major requirements, and upper-division requirements continue to be specified by each university. Appropriate sequencing of courses and timely completion of course prerequisites are essential to ensure efficient progress toward a baccalaureate degree. Students who have identified the university they plan to attend and/or a major area of study are advised to fulfill requirements and prerequisites identified by these programs through transfer guides and/or curriculum check sheets provided by the state universities. The AGEC does not replace articulation agreements developed to enhance the transfer process between specific institutions, e.g., Transfer Partnership Degrees. Nor does the AGEC eliminate the possibility that students who have identified the university they plan to attend and/or a major area of study will follow transfer guides provided by the state universities.

Upon completion of the AGEC, the community college will certify achievement of the block on the official institutional transcript.

The AGEC is reviewed and monitored each academic year by the subject area articulation task forces and the General Education Articulation Task Force (GEATF). The statewide GEATF is composed of representatives from each

Arizona community college and state university. The GEATF is responsible for monitoring the AGEC and reviewing related appeals.

Appeal Procedure. Transfer students who feel they have been unjustly denied credit for courses they have taken may appeal to the standards committee of the colleges in which they have enrolled. This procedure does not apply to community college transfer of credit greater than the 64-hour maximum. The decision of this committee is final.

An applicant for transfer admission whose academic record fails to meet ASU admission standards is denied admission. Such an applicant, however, may write a letter of appeal accompanied by three letters of recommendation to the Undergraduate Admissions Board for reconsideration of his or her application:

UNDERGRADUATE ADMISSIONS BOARD
ARIZONA STATE UNIVERSITY
PO BOX 870112
TEMPE AZ 85287-0112

The decision of this board is final and any conditions set by the board for future admissions supersede all other admission criteria or exceptions.

International Student Admissions

To comply with Immigration and Naturalization Services regulations, any student who plans to attend ASU on an F-1 or J-1 visa must

1. have a minimum GPA of 3.00 (4.00 = A) from secondary school course work if a freshman applicant, or have a minimum GPA of 2.50 (4.00 = A) from college or university course work if a transfer applicant;
2. meet basic competency requirements if he or she attended four years of high school in the United States;
3. submit a financial statement not more than six months old from a financial institution assuring adequate resources to support himself or herself while in residence at the university;
4. have all required admissions materials and credentials reach Undergraduate Admissions by May 1 if applying for the fall semester or October 1 if applying for the spring semester (an English translation of all foreign language documents is required);
5. pay a nonrefundable application fee of \$40 in U.S. funds; and
6. meet all appropriate immigration standards and requirements.

Credit from a Foreign Institution. Transfer credits or advanced standing is granted for academic course work completed at foreign tertiary institutions that are either recognized by the home government/Ministry of Education as a degree-awarding institution or attached to a regionally accredited U.S. college or university as a Study Abroad Program. No credit is awarded for English composition courses completed at foreign institutions (credit may be awarded at the discretion of ASU when the credit was completed in a country whose native language is English). There are no advanced credits for the international affiliation programs overseas unless they comply with this general policy. For

more information, call Undergraduate Admissions at 480/965-2688.

Nondegree International Applicants. All students with F-1 and J-1 visas must maintain full-time status while studying in the United States. Undergraduate full-time status is defined as a minimum of 12 semester hours. However, students with F-1 and J-1 visas may be permitted to take a maximum of six semester hours at ASU as a nondegree student while maintaining full-time status at other higher education institutions or the American English and Culture Program (AECP) at ASU. Approval by the responsible office at the other institution and/or AECP is required to ensure that the student maintains full-time status in compliance with applicable U.S. laws and regulations.

TOEFL. Applicants whose native language is not English (identified by the U.S. Department of State Bureau of Public Affairs) must provide evidence of English language proficiency as indicated by acceptable scores on the Test of English as a Foreign Language (TOEFL) as follows:

The TOEFL requirement for general admission (preprofessional) to the university is 500 (paper-based) or 173 (computer-based). The TOEFL requirement for admission to the professional programs in the College of Engineering and Applied Sciences and the College of Nursing is 550 (paper-based) or 213 (computer-based).

The following exceptions apply to the TOEFL requirement:

1. Applicants who have earned a bachelor's degree from a regionally accredited college or university in the United States are exempt from the TOEFL.
2. Applicants who have completed 48 transferable semester hours at a U.S. college or university—including two semesters (six semester hours) of freshman composition that satisfy the ASU First-Year Composition requirement—with a cumulative GPA of 2.50 or higher are exempt from the TOEFL requirement.
3. Applicants who have completed four years of high school in a U.S. high school may be admitted to ASU without a TOEFL score but are subject to competency and aptitude requirements.
4. Applicants who have completed their junior and senior years of high school in a U.S. high school may be admitted with a minimum SAT verbal score of 550 or an ACT English score of 23 in lieu of a TOEFL score.

American English and Culture Program

The American English and Culture Program (AECP) features an intensive course of study designed for adult international students who desire to become proficient in English as a second language for academic, professional, or personal reasons. Inquiries about the curriculum, fee schedule, and other topics should be addressed to

AMERICAN ENGLISH AND CULTURE PROGRAM,
DEPARTMENT 4
ARIZONA STATE UNIVERSITY
PO BOX 873504
TEMPE AZ 85287-3504

Acceptance into the AECF is separate from admission to the university. For more information, see “American English and Culture Program,” page 688.

Applicants with Disabilities

Some classroom accommodations, such as braille, audio tapes, interpreting services, enlarged print, and lab material conversions, require an extended preparation time (i.e., one semester). For this reason, applicants with disabilities are encouraged to contact Disability Resources for Students (DRS) upon application to the university to request information regarding disability documentation/eligibility requirements and deadlines to ensure accommodations for the beginning of the semester. (If students miss DRS deadlines, DRS attempts to provide, but cannot guarantee, appropriate accommodations. Effective alternatives may be necessary.) *Disability identification to DRS is confidential and cannot affect eligibility for admission.*

Call 480/965-1234 (voice) or 480/965-9000 (TTY). Access the Web site at www.asu.edu/drs, or write

DISABILITY RESOURCES FOR STUDENTS
ARIZONA STATE UNIVERSITY
PO BOX 873202
TEMPE AZ 85287-3202

Admission of Undergraduate Nondegree Applicants

Any high school graduate is invited to enroll for eight or fewer semester hours per semester of undergraduate course work as a nondegree student. Students currently enrolled in high school and persons under the age of 18 may be admitted as nondegree students by submitting official ACT or SAT scores that meet the general aptitude requirements of the university. Persons admitted as nondegree students for a specific year and term must remain nondegree until the next semester.

Anyone interested in admission as a nondegree undergraduate student at ASU must submit to Undergraduate Admissions: (1) a Nondegree Undergraduate Application for Admission (including residency information) and (2) a \$40 nonrefundable application fee for applicants applying as nonresidents or residing outside Arizona. Applicants who are not high school graduates or who are younger than 18 must also submit ACT or SAT scores.

No more than 15 hours of completed nondegree work may be applied to a degree program. A nondegree student who decides to work toward a bachelor's degree must *apply for admission to a degree program* with Undergraduate Admissions and meet normal admission requirements.

Once registered in a regular degree program, a student is not permitted to register again in a nondegree status. Nondegree students are not eligible to receive most types of financial aid, nor are they eligible to receive certain benefits, such as veteran benefits.

Steps from Admission to Registration

Certificate of Admission. After being admitted, students receive a Certificate of Admission, an Immunization Verification form, and publications that contain information about orientation programs. International students additionally receive a Certificate of Eligibility (Form I-20 or IAP-66), which enables them to apply for the appropriate visa.

Upon receipt, students should check their admission information for accuracy and report any errors and changes to Undergraduate Admissions at 480/965-7788.

Orientation. University orientation programs for new students and their parents are provided at numerous times during the year, including the beginning of each semester. Each orientation program includes academic advising, campus tours, special events, and an introduction to university resources and procedures. Parent programs are also included. Newly admitted students are sent information preceding each orientation program. Students are strongly encouraged to attend orientation activities.

Immunization Requirements. Every newly admitted student born after December 31, 1956, must provide proof of measles/rubella immunity to the Student Health and Wellness Center. *Students are not permitted to register until proof of immunity to measles/rubella is on file with the Student Health and Wellness Center.*

The following proof of measles/rubella immunity is considered adequate: (1) two vaccinations of MMR (measles, mumps, rubella), at least one of which must have been given after December 31, 1979; or (2) a copy of laboratory test results that show immunity to both measles and rubella.

Measles/rubella immunity proof can be faxed to the Student Health and Wellness Center at 480/965-8914. Verification that the Student Health and Wellness Center received a student's proof of measles/rubella immunity can be confirmed by going to www.asu.edu/registrar on the Web two working days after the information has been faxed to the Student Health and Wellness Center.

In addition, it is recommended that students also be immunized against mumps, tetanus, hepatitis-B, diphtheria, and meningitis. Special populations may need other vaccines. For more information on measles requirements, visit the Student Health and Wellness Center's Web site at www.asu.edu/health.

International Student Enrollment. International students must complete these additional steps.

Student Health Insurance. All F-1 or J-1 visa students must have health and accident insurance through ASU, and the cost for insurance is automatically added to their registration bill. *No privately acquired insurance is accepted in place of the ASU insurance.* However, students who have health insurance through their government or sponsoring agency may qualify for an insurance waiver if that coverage has been preapproved by the university. No waivers may be granted after the first two weeks of classes. To find out if their sponsor is on the preapproved list, sponsored students and others who fall into this category are encouraged to contact the Student Health and Wellness Center at 480/965-2411 or visit the Student Health and Wellness Center Web site at www.asu.edu/health.

All international students must report to the International Student Office in Student Life upon arrival on campus.

Special Programs for Advanced Placement and Credit

No more than 60 hours of credit are awarded for any or all programs, including ASU comprehensive and proficiency examinations. In these categories, only credit earned

by comprehensive examination counts toward the resident credit requirement for graduation.

Advanced Placement. Students who have taken an advanced placement (AP) course of the College Entrance Examination Board (CEEB) in their secondary school and who have taken an AP Examination of the CEEB may receive university credit. No credit is given for any examination with a score of 2 or 1. There is no limit to the number of AP credits that can be used to meet the General Studies requirement, including the requirements in natural sciences (SQ and SG), and literacy and critical inquiry (L).

When the scores are received by the university directly from the CEEB, credit is awarded as shown in the "Advanced Placement Credit" table, page 62.

College-Level Examination Program (CLEP). Students who have taken a College-Level Examination of the College Entrance Examination Board may receive university credit. The table of CLEP credit applies to all students enrolling in the university for the first time in August 1975 and any student enrolling thereafter. CLEP examination credit is *not* given where (1) it duplicates credit previously earned by the student at the university or accepted by the university for work done elsewhere or (2) it is more elementary than a course in which the student has already received credit. All examinations are given monthly by University Testing Services.

There is no limit to the number of CLEP credits that can be used to fulfill the General Studies requirement. The General Studies requirement in natural sciences (SQ and SG) and literacy and critical inquiry (L) are not satisfied by CLEP (see the "General Studies Courses" table, page 81).

General Examinations. To obtain credit or placement, students must receive a standard score of 500 or higher for the General Examinations, except for English Composition with Essay, on which students must receive a standard score of 610 (1978 scale) or 500 (1986 scale). *Students who have completed 60 semester hours of credit are not eligible to receive any credit for the CLEP General Examinations.*

Subject Examinations. A standard score of 50 (except College Algebra and Spanish) or higher must be received to obtain credit for any subject examination. The completion of 60 semester hours does not preclude eligibility for additional credit for subject examinations.

All equivalency is subject to future review and possible catalog change. For more information, call University Testing Services at 480/965-7146 or stop by EDB 301.

International Baccalaureate Diploma/Certificate. Students who present an International Baccalaureate Diploma/Certificate may qualify for university credit, depending on the level of the examination and the grade received. Arizona State University grants credit for higher-level courses only. A grade of 5 qualifies the student to receive credit for up to two introductory courses while a grade of 4 qualifies a student to receive credit for one introductory course. No credit is awarded for English as a Second Language (English B). Credit is awarded according to the "International Baccalaureate Diploma/Certificate Credit" table, page 64.

Comprehensive Examinations. A comprehensive examination is intended to permit a student to establish academic credit in a field in which the student has gained experience

or competence equivalent to an established university course. Applications are given only for courses listed in the current catalog and only for courses in which a comprehensive examination can serve as a satisfactory measure of accomplishment.

A number of restrictions apply. The student must be enrolled at ASU with *no more than 100 semester hours of credit* earned. The examinations must be taken during the first two semesters in residence in a degree program at the university. *No more than 60 semester hours of credit may be established* by comprehensive examinations (including AP, IB, and CLEP credit) and independent learning courses.

Comprehensive examinations may not be taken in any course in which the student has been given admission credit or transfer credit from any educational institution. Credit may not be received for an examination in an elementary level of a field in which the student has earned more advanced credit nor for a prerequisite for a course already completed.

The decision on the suitability of course material for a comprehensive examination, the development of a comprehensive examination, and the administration of an examination are strictly departmental functions. An application is for one course only. The student completes an application form with the number, title, and number of semester hours for the course. When completed, the application must be approved by the student's advisor and the chair of the department responsible for offering the course.

The student must then pay the stated fee for such examinations at Cashiering Services. The receipt must be taken to the departmental office.

The examination is prepared by the instructor who normally conducts the course, and it is comprehensive in nature and scope. The instructor and other experts designated by the chair grade the examination, using letter grades "A," "B," "C," "D," or "E." If the grade is "C" or higher, a mark of "Y" is entered on the student's permanent record; otherwise, no entry is made. Credit by examination is indicated as such on the record. The student is notified by mail of the result of the examination. In cases of failure ("D" or "E"), the student is not given an opportunity to repeat the examination.

A student pursuing a second baccalaureate degree may not receive credit by comprehensive examination, but, with prior approval of the college, the student may use the examination to waive a course requirement if a grade of "C" or higher is earned.

Proficiency Examinations. Proficiency examinations and auditions are given

1. to waive a course requirement;
2. to validate certain transfer credits in professional programs; and
3. to determine a student's ability in a field where competence is an important consideration.

Detailed information may be obtained from the dean's office of the college in which the student is registered.

Advanced Placement Credit

Examination	Score	Semester Hours	Equivalency
Art—History	5 or 4	6	ARS 101, 102
	3	3	ARS 101 or 102
Art—Studio—Drawing	5	6	ART 111, 112
	4	3	ART 111
Art—Studio—General	5	6	ART 111, ¹ 112
	4	3	ART 112
Biology	5 or 4	8	BIO 181, 182
	3	4	BIO 181
Chemistry	5 or 4	9	CHM 113, 115
	3	4	CHM 113
Computer Science A	5 or 4	3	CSE 100
Computer Science AB	5 or 4	6	CSE 100, 200
Economics—Introductory Macroeconomics	5 or 4	3	ECN 111
Economics—Introductory Microeconomics	5 or 4	3	ECN 112
English—Language and Composition	5 or 4	6	ENG 101, 114 eligible for ENG 102
English—Literature and Composition	5 or 4	6	ENG 101, 204 eligible for ENG 102
Environmental Science	5 or 4	3	PLB 322
French—Language	5	14	FRE 201, 202, 311, 312
	4	11	FRE 201, 202, 311
	3	8	FRE 201, 202
French—Literature	5	18	FRE 111, 201, 202, 321, 322
	4	12	FRE 111, 201, 202
	3	8	FRE 201, 202
German—Language	5	14	GER 201, 202, 311, 312
	4	11	GER 201, 202, 311
	3	8	GER 201, 202
German—Literature	5	15	GER 111, 201, 202, 314
	4	12	GER 111, 201, 202
	3	8	GER 201, 202
History—American or European	5 or 4	6	HST 109 and 110 <i>or</i> HST 103 and 104
Latin—Language	5	16	LAT 101, 102, 201, 202
	4	12	LAT 101, 102, 201
	3	8	LAT 101, 102
Mathematics—Calculus AB	5, 4, or 3	4	MAT 270
Mathematics—Calculus BC	5 or 4	8	MAT 270, 271
	3	4	MAT 270
Music	5 or 4	3	MTC 125
Physics B	5 or 4	6	PHY 111, 112
	3	3	PHY 111
Physics C—Electricity and Magnetism	5 or 4	3	PHY 112 ²
Physics C—Mechanics	5 or 4	3	PHY 111 ²
Political Science—American Government and Politics	5 or 4	3	POS 110
Political Science—Comparative Government and Politics	5 or 4	3	POS 150
Psychology	5 or 4	3	PGS 101
Spanish—Language	5	14	SPA 201, 202, 311, 312
	4	11	SPA 201, 202, 311
	3	8	SPA 201, 202
Spanish—Literature	5	15	SPA 111, 201, 202, 325
	4	12	SPA 111, 201, 202
	3	8	SPA 201, 202
Statistics	5 or 4	3	STP 226

¹ ART 115 credit may be awarded in place of ART 111 based on the School of Art's evaluation of 3D art submitted as part of the AP portfolio.

² Students may petition the department for additional credit and/or equivalencies based on laboratory and/or calculus content of their AP courses.

CLEP Credit

Examinations	Semester Hours	Equivalency
General		
English Composition	0	With essay qualifies for ENG 105.
Humanities	6	Elective credit
Mathematics	3	MAT 106
Natural Sciences	8	Elective credit
Social Sciences and History	6	Elective credit
Subject		
American Government	3	POS 110
American History—Early Colonization to 1877	3	HST 109
American History—1865 to the Present	3	HST 110
American Literature	6	ENG 241, 242
Analysis and Interpretation of Literature	3	Elective credit
Calculus with Elementary Functions	4	MAT 270
College Algebra (1993) (replaces College Algebra [1979])	3	MAT 117 (Students must score 46 or higher to receive credit.)
College Algebra and Trigonometry	3	MAT 170
College French	8	FRE 101, 102
College German	8	GER 101, 102
College Spanish	4	SPA 101 (Students must score 45 or higher to receive credit.)
College Spanish	8	SPA 101, 102 (Students must score 50 or higher to receive credit.)
College Spanish	12	SPA 101, 102, 201 (Students must score 55 or higher to receive credit.)
College Spanish	16	SPA 101, 102, 201, 202 (Students must score 60 or higher to receive credit.)
English Literature	3	Elective credit
Freshman College Composition (replaces College Composition and Freshman English)	0	With satisfactory essay qualifies for ENG 105.
General Biology	8	BIO 181, 182
General Chemistry	9	CHM 113, 115
Human Growth and Development	0	No credit
Information Systems and Computer Applications	3	Elective credit
Introduction to Educational Psychology	0	No credit
Introductory Accounting	6	Elective credit
Introductory Business Law	3	Elective credit
Introductory Psychology	3	PGS 101
Introductory Sociology	3	SOC 101
Principles of Macroeconomics (replaces Introductory Macroeconomics)	3	ECN 111 (Students must score 75 or higher to receive credit. College of Business students may not use this credit for the ECN 111 requirement.)
Principles of Management	0	No credit
Principles of Marketing	0	No credit
Principles of Microeconomics (replaces Introductory Microeconomics)	3	ECN 112 (Students must score 75 or higher to receive credit. College of Business students may not use this credit for the ECN 112 requirement.)
Trigonometry	0	No credit
Western Civilization—Ancient Near East to 1648	6	HST 102, 103
Western Civilization—1648 to the Present	3	HST 104

UNIVERSITY TESTING REQUIREMENTS

All new, transfer, or readmitted undergraduate students who plan to enroll for seven or more semester hours must meet one of the following testing requirements. *Students who fail to meet at least one of these requirements will not be allowed to register for any course the following semester.*

1. Take the ACT English or SAT verbal examination and have scores submitted to ASU.
2. Receive a score of 4 or 5 for the advanced placement examination in English offered by the College Entrance Examination Board and have scores submitted to ASU.

International Baccalaureate Diploma/Certificate Credit

Examination	Score	Semester Hours	Equivalency
Art/Design	7, 6, or 5	6	ART 111, 112
	4	3	ART 112
Biology	7, 6, or 5	8	BIO 181, 182
	4	4	BIO 181
Chemistry	7, 6, or 5	9	CHM 113, 115
	4	4	CHM 113
Economics	7, 6, or 5	6	ECN 111, 112
	4	3	ECN 111
English A	7, 6, or 5	6	ENG 101, 114
	4	3	ENG 114
English B	No credit	0	None
Foreign Language A or B*	7, 6, or 5	8	Foreign language 101, 102
	4	4	Foreign language 101
History—American	7, 6, or 5	6	HST 109, 110
	4	3	HST 109
History—European	7, 6, or 5	6	HST 103, 104
	4	3	HST 103
Mathematics	7, 6, 5, or 4	4	MAT 270
Physics	7, 6, or 5	8	PHY 111, 112, 113, 114
	4	4	PHY 111, 113

* No credit is awarded if the language is the student's native language.

3. Take the CLEP general examination in English, earning a score that qualifies for placement in ENG 105, and have scores submitted to ASU.
4. Have previously taken ENG 101, 102, 105, 107, or 108 at ASU and received a grade of "D" or higher. If the course was taken before 1980, contact the Recording Section, in SSV 142, before registering for classes.
5. Transfer a course equivalent to ENG 101, 102, 105, 107, or 108 with a grade of "C" or higher. An official transcript showing the grade must be received at ASU at least six weeks before registration. If a student transfers an equivalent composition course from a public community college or university in Arizona, the equivalency is automatically posted, and the student need not take further action. A student transferring a composition course from any other college or university must have the course evaluated for equivalency. See "First-Year Composition Requirement," page 74, for more information.

Placement Examinations

English. New students and continuing, reentry, transfer, and nondegree students who have not taken any composition courses are placed in First-Year Composition courses according to their scores on the ACT English or SAT verbal tests.

Note: The ACT and SAT scoring systems have been modified. Shown in parentheses are equivalent ACT scores for tests taken before October 1989 and equivalent SAT scores for tests taken before April 1995.

Students who score 18 (16) or below on the ACT English test or 460 (380) or below on the SAT verbal test must enroll in WAC 101, a basic writing course (see "Writing Across

the Curriculum," page 360). Students who score between 19 (17) and 28 (24) on the ACT English test or between 470 (390) and 650 (580) on the SAT verbal test are eligible to enroll in ENG 101. Students who score 29 (25) or higher on the ACT English test or 660 (590) or higher on the SAT verbal test may take ENG 105 in place of ENG 101 and 102. Students may qualify for ENG 105 by achieving appropriate scores on the CLEP General Examination in English Composition with Essay or the CLEP Subject Examination in College Composition with Essay. For more information, go to University Testing Services, in EDB 301, access the Web site at www.asu.edu/uts, or call 480/965-7146.

Foreign Language. For information regarding foreign language placement testing, see "Foreign Language Requirement," and "Foreign Language Placement," page 388, and "Special Programs for Advanced Placement and Credit," page 60.

Mathematics. Placement examinations are not required before registering in mathematics courses at ASU. However, mathematics placement exams should be taken before the start of the semester for MAT 106, 117, 170, and 270. For more information, visit the Department of Mathematics undergraduate office, in PS A211, or access the Web site at fym.la.asu.edu/placement.

Academic Advising

Effective academic advising of students is an essential aspect of the educational experience at ASU. The university is committed to providing quality advising to continuing, first-time, and transfer students. To achieve the highest-quality advising, students, faculty, and staff must work to form a partnership. To ensure timely and accurate advising to their majors, each college has advisors to assist students in developing programs of study, assessing educational

Academic Advising at ASU Main

College	Location	Telephone	Days	Hours ¹	Web Address
Barrett Honors College	IRISH A121	480/965-9155	Mon.–Fri.	8 A.M.–5 P.M. ²	www.asu.edu/honors
College of Architecture and Environmental Design	ARCH 141	480/965-3584	Mon.–Fri.	8:30 A.M.–noon, 1–4 P.M.	www.asu.edu/caed
College of Business	BA 123	480/965-4227	Tues. Other weekdays	9 A.M.–6:30 P.M. 9 A.M.–4:30 P.M.	www.cob.asu.edu/up/ indexupo.cfm
College of Education	EDB L1-13	480/965-5555	Mon.–Fri.	8 A.M.–5 P.M.	www.asu.edu/educ/ osa
College of Engineering and Applied Sciences	ECG 100	480/965-3421	Mon.–Fri.	8:30 A.M.–noon, 1–5 P.M. ²	www.eas.asu.edu
College of Law	LAW 101	480/965-1474	Mon.–Fri.	8 A.M.–5 P.M. ³	www.law.asu.edu
College of Liberal Arts and Sciences	SS 111	480/965-6506	Mon.–Fri.	8 A.M.–5 P.M.	clasdean.la.asu.edu/ student/resources
College of Nursing	NUR 108	480/965-2987	Mon.–Fri.	8:30 A.M.–5 P.M.	www.asu.edu/nursing
College of Public Programs	WILSN 203	480/965-1034	Mon.–Fri.	8:30 A.M.–noon, 1–5 P.M.	www.asu.edu/copp/ coppadv.html
Cross-College Advising Services	UASB 129	480/965-4464	Mon., Wed. Tues., Thurs., Fri.	9 A.M.–6:30 P.M. 9 A.M.–5 P.M.	www.asu.edu/duas/ cas
Graduate College	WILSN lobby	480/965-3521	Mon.–Fri.	8 A.M.–6 P.M. ²	www.asu.edu/ graduate/ fr_checklist.html
Herberger College of Fine Arts	GHALL 127	480/965-4495	Mon.–Fri.	8 A.M.–noon, 1–5 P.M.	www.asu.edu/cfa

¹ Arizona is on mountain standard time all year and does not observe daylight saving time.

² Walk-ins are welcome; appointments are recommended.

³ Call for additional hours.

goals, and understanding rules, procedures, and curriculum requirements. In some colleges, these advisors are faculty members. In others, they are full-time, professional advisors. In most instances, students have academic and career advising available from both faculty members and full-time advisors. Students are encouraged to take advantage of the skill and knowledge of the advising professionals available to them. Most new students and many continuing students have mandatory advising as a condition of registration.

An additional unit, Cross-College Advising Services (CAS), is a central advising, referral, and information facility whose staff is available to assist students in their academic careers at ASU. Emphasis is placed on advising services to first-time, prospective, transfer, and visiting students and students in transition, such as those changing majors and those without majors. Bachelor of Interdisciplinary Studies majors (B.I.S. or pre-B.I.S.) also receive academic advising in CAS. In addition to guidance in the exploration or selection of a major, CAS provides general academic information and referrals to all areas of student academic support. For more information, visit CAS in UASB 129, or call 480/965-4464.

Students are strongly encouraged to seek academic advising at the earliest possible time and regularly throughout their academic careers, whether or not advising is mandatory in their particular programs. Advisors may be contacted at the locations and times shown in the “Academic Advising at ASU Main” table, on this page. For academic advising at ASU East, see the “Academic Advising at ASU East” table, page 605. See “Building Abbreviations,” page 720, for a list of building abbreviations and names.

Readmission to the University

Undergraduate students who have previously attended ASU but have not been enrolled at ASU for one semester or more are required to apply for readmission for the semester in which reenrollment is intended. Nonresident applicants must submit a nonrefundable \$40 application fee. If, meanwhile, the student has attended another accredited college or university, it is necessary for the student to have on file an official transcript of all academic work taken. Failure to report such attendance is considered misrepresentation and falsification of university records. In addition, it is considered cause for Records Hold action and withholding of further registration privileges. An applicant for readmission must meet the requirements for good standing. See “Retention and Academic Standards,” page 71, and the requirements of the college to which the application is being made. An applicant who has been denied readmission may appeal to the University Undergraduate Admissions Board. Nongraduate applicants for readmission must have a minimum GPA of 2.00. If not, the applicant must apply to ASU through Undergraduate Admissions.

Conditional Readmission. A student completing academic work in progress at another institution may be granted conditional readmission. This conditional status remains effective until a final official transcript is received. The student is subject to Records Hold action, and additional registration privileges are withheld if this condition for readmission is not cleared by midsemester.

Academic Renewal

Academic renewal is a university policy administered for the purpose of recalculating the ASU cumulative GPA of undergraduate students who have been readmitted to a degree program after an absence of at least five continuous calendar years including summer sessions and who have completed in good standing a minimum of 12 college-approved additional hours in residence within three semesters after reentry. Students may have the former academic record before the five-year absence (including transfer credits) accepted in the same manner as if the credits were transfer credits. That is, earned hours are carried forward for up to 60 hours of credit in which a grade of “C” or higher was earned. The cumulative GPA is based only on credits earned subsequent to the student’s reentry. All graduation residency, academic recognition residency, and GPA requirements must be fulfilled after academic renewal.

A request for academic renewal follows this procedure:

1. Students interested in academic renewal must request the Application for Academic Renewal from the Readmission Section of the Office of the Registrar or the dean of the college offering the major.
2. The Application for Academic Renewal may be submitted immediately upon readmission but not later than the start of the third semester after readmission.
3. The Application for Academic Renewal is submitted by the student to the dean of the college offering the major.
4. The dean specifies in advance a minimum of 12 semester hours.
5. When the approved credits are completed with a cumulative GPA of 2.50 or higher, and no grade lower than “C” in each course, the dean forwards the Application for Academic Renewal to the Office of the Registrar for processing.

Only students working toward their first undergraduate degree are eligible to apply for academic renewal, which may be effected only once during a student’s academic career. Academic renewal is transferable among colleges. All students with ASU GPAs below 2.00 are eligible to petition for academic renewal. Individual colleges may elect to entertain petitions for academic renewal from students with ASU GPAs above 2.00. College standards committees have final authorization on academic renewal petitions. Eligibility for graduation is based on the ASU cumulative GPA after academic renewal. However, a student’s complete record—before and after academic renewal—remains on the transcript and may be taken into consideration when a student applies for undergraduate professional or graduate programs.

Registration

All persons attending a class at ASU must be registered for that class. A student is considered to be registered when all registration fees have been paid in full.

Eligibility. Only eligible students may register for courses at ASU. An eligible student is either continuing from the previous semester or has been admitted or readmitted to the university. See “Undergraduate Admission,” page 54, and “Readmission to the University,” page 65.

Proof of Identification. To receive university services, photo identification must be presented. Each admitted or readmitted student who completes the registration process for a regular semester needs to obtain a student identification card. This photo identification card is valid for the duration of the student’s enrollment at ASU.

Photo IDs are issued throughout the semester at the Sun Card office located in the Memorial Union on Main Campus, and at the OASIS in the Center Building on East Campus. See the *Schedule of Classes* or refer to “Sun Card/ID Card,” page 44.

Registration Fees. Registration fees are due and must be paid in full at the time specified each semester in the *Schedule of Classes*. If any payment tendered is unauthorized, incomplete, or received after the due date, registration fees are considered not paid.

Schedule of Classes. The *Schedule of Classes*, published for the fall and spring semesters, and the *Summer Sessions Bulletin* are distributed without charge. These publications are available online at www.asu.edu/registrar/schedule. They list course offerings, dates, times, places, and procedures for registration, along with other important information relating to the term.

Course Loads. A minimum full-time course load for an undergraduate student is 12 semester hours. The maximum course load for which a student may register is 18 semester hours (with the exception of a 19-hour maximum for students enrolled in the Colleges of Engineering and Applied Sciences or Architecture and Environmental Design). A student wishing to register for more than the maximum must petition the standards committee of the college in which the student is enrolled and must obtain an approved override before registration. See “Summer Session Semester Hour Load,” on this page, for summer course load information.

Reserving of Course Credit by Undergraduates. Seniors at ASU within 12 semester hours of graduation may enroll in a 400-level or graduate course and reserve the credit for possible use in a future graduate program. The course cannot be used to meet a baccalaureate graduation requirement. Before registration in the course, the student must submit a Graduate College Petition form requesting credit reservation. The form must be signed by the student’s advisor, the head of the academic unit offering the class, and the dean of the Graduate College.

Permission to reserve a course does not guarantee admission to a graduate degree program or that the course may be used toward graduate degree requirements. A maximum of nine semester hours may be reserved, and only courses with an “A” or “B” grade are applicable. Reserved credit earned before admission to a graduate degree program is classified as nondegree credit. The maximum course load for a student enrolled in a reserved course is 15 semester hours during a regular semester and six hours during a summer session.

Summer Session Semester Hour Load. The summer session semester hour load limit is seven semester hours for each five-week session and nine semester hours for the eight-week session. The student may not exceed a total of 14 semester hours for any combination of sessions.

Concurrent Enrollment. Provided that the other institution’s regulations concerning enrollment, graduation

Enrollment Verification Guidelines

Term	Student	Full Time	Half Time	Less Than Half Time
Regular semester	Undergraduate	12 or more hours	6–11 hours	5 or fewer hours
	Graduate	9 or more hours	5–8 hours	4 or fewer hours
	Research assistant	6 or more hours	—	—
Five-week summer session	Undergraduate	4 or more hours	2 hours	1 hour
	Graduate	3 or more hours	2 hours	1 hour
	Research assistant	2 or more hours	1 hour	—
Eight-week summer session	Undergraduate	6 or more hours	3–5 hours	2 or fewer hours
	Graduate	5 or more hours	3–4 hours	2 or fewer hours

requirements, and transfer of credits are not violated, a student may enroll in classes at other institutions or in independent learning courses while enrolled at ASU. However, the student is urged to seek advising before concurrent enrollment to assure orderly progress toward a degree. If total credits exceed the maximum course load, prior permission must be granted by the college standards committee. See “Course Loads,” page 66.

Attendance. The instructor has full authority to decide whether class attendance is required.

Enrollment Verification Guidelines. The registrar is responsible for verifying enrollment according to the general guidelines in the “Enrollment Verification Guidelines” table, on this page. Independent learning courses are not considered for enrollment verification purposes.

Cooperative Programs

Cooperative Education. Cooperative education at ASU is any educational program that requires *alternating classroom and work experience* in government or industry. The work experience exists for its educational value.

Full-Time Status of Co-op Students. A co-op student, during a work semester, is identified as both co-op and full time by the university. To qualify, the student must have met prescribed hours and GPA requirements.

Rights and Privileges of Co-op Students. During their work semesters, co-op students have the rights, privileges, and protections—with regard to university matters—accorded to full-time students, except financial aid. They maintain catalog continuity and have student access to university facilities and events.

Financial Aid for Co-op Students. Co-op students are not identified to lenders (including ASU) as being in loan repayment status. They have an “in school” full-time enrollment status. Co-op students do not receive any financial aid disbursement during their co-op semesters, *nor are such awards transferred to another semester.* The student is responsible for notifying Student Financial Assistance as soon as plans for a co-op term are made but no later than 10 days before the co-op term begins. The department or school is responsible for notifying Student Financial Assistance of students approved for co-op terms.

Traveling Scholar Program. The Traveling Scholar Program is a cooperative program among the state universities designed to enable students to take advantage of programs or special resources that are not available at their own insti-

tutions. Any undergraduate student with a GPA of at least 2.50 or graduate student with a GPA of at least 3.00 enrolled at ASU, Northern Arizona University, or University of Arizona may be designated a Traveling Scholar by prior mutual agreement of the appropriate academic authorities at both the sponsoring and hosting institutions. Contact the Registrar’s Records Information Section for more information and the application form.

Grading System

DEFINITIONS

Unit of Credit

The Arizona Board of Regents has defined (May 26, 1979) a unit of credit for the institutions under its jurisdiction. A minimum of 45 hours of work by each student is required for each unit of credit. An hour of work represents a minimum of 50 minutes of class time—often called a “contact hour”—or 60 minutes of independent study work. For lecture-discussion courses, this requirement equates to at least 15 contact hours and a minimum of 30 hours of work outside the classroom for each unit of credit. Even though the values of 15 and 30 may vary for different modes of instruction, the minimum total of 45 hours of work for each unit of credit is a constant. Since the unit of credit as defined by the Arizona Board of Regents is the cornerstone of academic degree programs at ASU, degrees granted by other institutions that are recognized by ASU should be based on a similar unit of credit.

Grades and Marks

All grades and marks appear on the permanent record and/or unofficial transcript.

They are indicated by the letters shown in the “Grades” table, page 68.

Grading Options

Ordinarily a grade of “A,” “B,” “C,” “D,” or “E” is given upon completion of a course, unless a grading option of “audit” or “pass/fail” is indicated at the time of registration. *Grading options cannot be changed after the close of the drop/add period.*

Incomplete

A mark of “I” (incomplete) is given by the instructor only when a student who is otherwise doing acceptable work is unable to complete a course because of illness or other conditions beyond the student’s control. The mark of “I” should be granted only when the student can complete the unfinished work with the same instructor. However, an

incomplete (“I”) may be completed with an instructor designated by the department chair if the original instructor later becomes incapacitated or is otherwise not on campus. The student is required to arrange with the instructor for the completion of the course requirements. The arrangement is recorded on the Request for Grade of Incomplete form. The student has one calendar year from the date the mark of “I” is recorded to complete the course. If the student completes the course within the calendar year, the instructor must submit a Request for Grade of Incomplete/Authorization for Change of Grade form to the Office of the Registrar, whether the student passed or failed the course. Marks of “I” are changed to a grade of “E” for purposes of evaluating graduation requirements for undergraduate students. Marks of “I” received in the fall 1983 semester or thereafter for undergraduate courses that have been on a student’s record for more than one calendar year are automatically changed to a grade of “E.” An undergraduate student does not reregister or pay fees for a course for which an incomplete “I” has been received in order to complete the course.

Students who receive a mark of “I” in courses at the 500 level or above have one calendar year to complete the course for a grade. After one calendar year, the mark of “I” becomes a permanent part of the transcript. To repeat the course for credit, a student must reregister and pay fees. The grade for the repeated course appears on the transcript but does not replace the permanent “I.”

Grades

Grade	Definition	Value
A	Excellent	4.00
B	Good	3.00
C	Average	2.00
D	Passing	1.00
E	Failure	0.00
I	Incomplete	—
NR	No report	—
P	Pass	—
RC*	Remedial credit	—
RN*	Remedial no credit	—
W	Withdrawal	—
X	Audit	—
Y	Satisfactory	—

* This grade appears on only unofficial copies of ASU transcripts.

Satisfactory

A mark of “Y” (satisfactory) may be used at the option of individual colleges and schools within the university and is appropriate for internships, projects, readings and conferences, research, seminars, theses, and workshops. The “Y” is included in earned hours but is not computed in the GPA.

Credit Enrollment

The semester hour is the unit on which credit is computed. It represents one 50-minute class exercise per week per semester. To obtain credit, a student must be properly registered and must pay fees for the course.

Audit Enrollment

A student may choose to audit a course, in which case the student attends regularly scheduled class sessions, but no credit is earned. The student should obtain the instructor’s

approval before registering and paying the fees for the course. Selected courses may not be audited. Veteran students using education benefits should see “Veterans Services,” page 36.

The mark of “X” is recorded for completion of an audited course, unless the instructor determines that the student’s participation or attendance has been inadequate, in which case the mark of “W” (unrestricted withdrawal) may be recorded. This grading option may not be changed after the close of drop/add. The “X” is not included in earned hours and is not computed in the GPA.

Pass/Fail Enrollment

A mark of “P” (pass) or “E” (fail) may be assigned for this grading option. This grading method may be used at the option of individual colleges and schools within the university. Consult the college dean’s office for detailed information and restrictions before registration. “P” is included in earned hours but is not computed in the GPA.

Remedial Enrollment

A mark of “RC” (remedial credit) or “RN” (remedial no credit) may be assigned for this grading option. The course appears on an unofficial ASU transcript but does not appear on the grade report or official ASU transcript and is not included in earned hours. Remedial hours are included in verification of enrollment for purposes of loan deferment and eligibility.

WITHDRAWALS

Instructor-Initiated Drop

An instructor may drop a student for nonattendance during the second week of classes in fall or spring semesters or the first four days of each summer session. Instructor-initiated drops for nonattendance are signed by the dean or dean’s designee. The college notifies students by mail. The student must contact the instructor before the end of the first week of classes if absences during that period cannot be avoided.

Drop/Add

Students registering for courses for a semester or summer session may drop or add courses through the first week of classes in a semester or the first two days of a summer session. See the *Schedule of Classes* or the *Summer Sessions Bulletin* for dates of drop/add periods. During this period, a student may drop one or more but not all scheduled courses without penalty. Courses that are dropped do not appear on the student’s transcript and fees paid are fully refunded, depending on the student’s remaining hours. A student who wishes to withdraw from all courses during the drop/add period must process an unrestricted withdrawal.

Unrestricted Course Withdrawal

During the first four weeks of a semester or the first six days of a summer session, a student may withdraw from any course with a mark of “W.” See the *Schedule of Classes* or the *Summer Sessions Bulletin* for dates of the unrestricted withdrawal period.

Restricted Withdrawal

From the fifth week to the end of the 10th week of a semester and from the seventh day to the end of the third week of a summer session, students may withdraw with a mark of “W” from only courses in which the instructor cer-

tifies that they are passing at the time of the withdrawal. See the *Schedule of Classes* or the *Summer Sessions Bulletin* for dates of the restricted withdrawal period.

The number of restricted withdrawals with the mark of “W” is limited. One restricted withdrawal is assessed for each course withdrawn from, unless the student is withdrawing from all courses. A complete withdrawal results in the assessment of one restricted withdrawal against a student’s limit. The number of withdrawals is a total of two for students during freshman, sophomore, junior, or senior standing; and a total of two for students during second undergraduate degree standing. Non-degree-seeking graduate students are permitted to process an unlimited number of restricted withdrawals. Students must obtain a Restricted Withdrawal Request and obtain the signature of the instructor. The instructor has the option of assigning either a “W” or a failing grade of “E.”

Students who have reached their restricted withdrawal limit are not allowed to process any additional restricted course withdrawals. However, students are allowed to process a restricted complete withdrawal even when they have reached the restricted withdrawal limit. The preceding limits do not prevent students from processing a complete withdrawal from the university with marks of “W” or “E.” Complete withdrawal counts as one withdrawal for purposes of applying the above limits. The preceding does not apply to audit enrollment or zero-hour labs and recitations.

Procedure for Restricted Withdrawal. A student seeking a restricted withdrawal needs to

1. obtain a withdrawal form from any registrar site;
2. obtain a signature and verification of grade from instructor(s); and
3. have the form processed at any registrar site.

Instructor-Initiated Withdrawal

An instructor may withdraw a student from a course with a mark of “W” or a grade of “E” only if the student’s continued presence in the course is disruptive to the instructor’s ability to conduct the course. A student may appeal an instructor-initiated withdrawal within 10 days of being withdrawn to the standards committee of the college in which the course is offered. The decision of the committee is final. Restricted withdrawal limits do not apply to withdrawals initiated by an instructor.

Withdrawal from the University

To withdraw from *all* classes after having paid registration fees, a student must submit a request in person, withdraw using InTouch, or submit a signed request to the Office of the Registrar. The InTouch complete withdrawal option is only available through the first week of classes for a semester. During the unrestricted complete withdrawal period, a student may withdraw from all courses with marks of “W.” During the restricted complete withdrawal period, a student may withdraw with marks of “W” only from courses that the instructors certify the student was passing at the time of withdrawal. See the *Schedule of Classes* or the *Summer Sessions Bulletin* for dates of the complete withdrawal periods. No one is permitted to withdraw from the university or to conduct any registration transaction in the last two weeks of the semester. The date of the complete withdrawal is always the date the withdrawal form or letter is received in the Office of the Registrar.

Medical/Compassionate Withdrawal

A medical/compassionate withdrawal request may be made in extraordinary cases where serious illness or injury (medical) or another significant personal situation (compassionate) prevents a student from continuing in his or her classes, and where incompletes or other arrangements with the instructor are not possible. Usually, consideration is for complete withdrawal. All applications for withdrawal require thorough and credible documentation. Application for less than a complete withdrawal must be especially well documented to justify the selective nature of the medical/compassionate withdrawal request.

A student may request and be considered for a *medical* withdrawal when extraordinary circumstances, such as a serious illness or injury, prevent the student from continuing in classes. This policy covers both physical-health and mental-health difficulties.

A student may request and be considered for a *compassionate* withdrawal when extraordinary personal reasons, not related to the student’s physical or mental health (for example, care of a seriously ill child or spouse, or a death in the student’s immediate family), prevent the student from continuing in classes.

Each college has a dean’s representative (medical/compassionate withdrawal designee) to review medical/compassionate withdrawal requests, according to that college’s procedures. A student requesting a medical/compassionate withdrawal is referred to the dean’s designee of the college of the major. A nondegree student is referred to the dean’s designee of the college with which he or she is primarily affiliated. The dean’s designee determines the appropriateness of the medical/compassionate withdrawal request and whether an administrative hold is indicated. Removal of the hold must be authorized by the designee before the student can register for a future semester or be readmitted to the university.

The medical/compassionate withdrawal procedure results in a special note line on the unofficial transcript. Refunds are not given beyond six months past the close of the semester. Only one Request for Documented Medical/Compassionate Withdrawal form needs to be filed with the college of the major, even if classes in more than one college are involved. Medical/compassionate withdrawal applications and supporting documents are retained and filed separately from the student’s other records.

GRADE POINTS

For the purpose of computing the grade point average (GPA), grade points are assigned to each of the grades for each semester hour as follows: “A,” four points; “B,” three points; “C,” two points; “D,” one point; “E,” zero points. GPAs are rounded to the nearest 100th of a grade point.

Grade Point Average

Grade points earned for a course are multiplied by the number of semester hours to produce honor points. For example, receiving an “A,” which is assigned four grade points, in a three-semester-hour course would produce 12 honor points. The grade point average (GPA) is obtained by dividing the total number of honor points earned by the total number of semester hours graded “A,” “B,” “C,” “D,” or “E.” Other grades do not carry grade points. *Semester* GPA

is based on *semester* net hours. *Cumulative* GPA is based on *total* net hours.

Change of Grade

Ordinarily the instructor of a course has the sole and final responsibility for any grade reported. Once the grade has been reported to the registrar, it may be changed upon the signed authorization of the faculty member who issued the original grade. Approval for the change is also required by the department chair and the dean of the college concerned. This policy also applies to the grade of “I” (incomplete).

University Policy for Student Appeal Procedures on Grades

Informal. The steps outlined on this page, beginning with step A, must be followed by any student seeking to appeal a grade. Student grade appeals must be processed in the regular semester immediately following the issuance of the grade in dispute (by commencement for fall or spring), regardless of whether the student is enrolled at the university. It is university policy that students filing grievances and those who are witnesses are protected from retaliation. Students who believe they are victims of retaliation should immediately contact the dean of the college in which the course is offered.

- A. The aggrieved student must first undergo the informal procedure of conferring with the instructor, stating the evidence, if any, and reasons for questioning that the grade received was not given in good faith. The instructor is obliged to review the matter, explain the grading procedure used, and show how the grade in question was determined. If the instructor is a graduate assistant and this interview does not resolve the difficulty, the student may then go to the faculty member in charge of the course (regular faculty member or director of the course sequence) with the problem.
- B. If the grading dispute is not resolved in step A, the student may appeal to the department chair or other appropriate chair of the area within the department (if any). The department chair may confer with the instructor to handle the problem. Step B applies only in departmentalized colleges.
- C. If these discussions are not adequate to settle the matter to the complainant’s satisfaction, the student may then confer with the dean of the college concerned (or the dean-designate), who will review the case. If unresolved, the dean or designate may refer the case to the college academic grievance hearing committee to review the case formally. In most instances, however, the grievance procedure does not go beyond this level.

Formal. The following procedure takes place after steps A, B, and C (or A and C) have been completed.

- D. Each college has on file in the office of the dean (and in each department of the college) the procedures and composition of the undergraduate or graduate academic grievance hearing committee for student grievances. Each college committee shall operate under grievance procedures as stated which satisfy due process requirements. The committee shall always meet with the student and the instructor in an attempt to resolve the

differences. At the conclusion of the hearing, the committee shall send its recommendations to the dean.

- E. Final action in each case will be taken by the dean after full consideration of the committee’s recommendation. Grade changes, if any are recommended, may be made by the dean. The dean shall inform the student, instructor, department chair (if any), the registrar, and the grievance committee of any action taken.

Repeating Courses

An undergraduate course taken at ASU may be repeated for credit if the grade of “D,” “E,” or “W” or a mark of “X” is received. An undergraduate student may not repeat for credit an undergraduate course in which a grade of “C” or better is earned. Undergraduate courses in which grades of “D” or “E” are received may be repeated only once. After an undergraduate student repeats 100- and 200-level courses, the student’s transcript shows both grades, but the student’s cumulative GPA reflects only the higher grade. After an undergraduate student repeats 300- or 400-level courses, the student’s cumulative GPA and the transcript reflect both grades.

After completing the course, the student must file a Deletion Form with the Office of the Registrar. To be eligible for the deletion of “D” or “E” grades, the course must be repeated at ASU. Students who have graduated are not eligible to delete the grade for a course taken before the award of the ASU bachelor’s degree.

This policy does not apply to seminar and independent study courses with different content each semester. This policy affects only undergraduate students and undergraduate courses.

Demonstration of Mastery

An undergraduate student who receives a “D” in a course in which a “C” or higher is required may use the grade from an equivalent course taken elsewhere to demonstrate mastery at the “C” or higher level. However, the course may neither be transferred to ASU (since credit has already been given for the course) nor computed in the student’s GPA.

Midterm Report

Instructors are required to evaluate students at midterm for academic progress. A student who has been evaluated for a “D” or “E” at midsemester receives a midterm report. The midterm “D” and “E” grades are not recorded on the student’s permanent record. Midterm reports are mailed to the student’s local address of record.

Final Grades

Grades may be viewed online at www.asu.edu/registrar or accessed through InTouch at 480/350-1500.

Records Hold

The Office of the Registrar enforces a financial records hold or administrative hold on the records of a student when an outstanding financial obligation or disciplinary action has been reported.

When a hold is placed on a record, the following results may occur:

1. No official or unofficial transcript is issued.
2. Registration privileges are suspended.
3. Other student services may be revoked.

The hold remains effective until removed by the initiating office. It is the student's responsibility to clear the conditions causing the hold.

Transcripts

The Office of the Registrar releases official transcripts *only upon the written request of the student*. The request must include the following information:

1. the student's name and former name(s);
2. the student ID number;
3. the date of birth; and
4. the dates of attendance.

The request for official transcript form is available online at www.asu.edu/registrar/forms.

The Office of the Registrar does not issue a transcript if the student has a financial records hold. The student must supply a specific address if the transcript is to be mailed. The fee for an official transcript for a student not enrolled is \$5 for the first copy. Additional copies ordered at the same time are \$1 each. The fee is \$1 per copy for a student enrolled for a current or future semester.

Unofficial transcripts may be requested in person at the Office of the Registrar or any registrar site, or by mail or fax (480/965-2295) if a signed release is enclosed. There is no charge for an unofficial transcript.

All in-person transcript requests require presentation of photo identification. Requests are not accepted from third parties without a written release from the student. For information on parental access to records, see "Access to Records," page 73.

Retention and Academic Standards

Class Standing. A student's class standing is determined by the number of hours earned, as shown in the "Class Standing" table below.

Class Standing

Student	Hours Earned
Freshman	24 or fewer hours earned
Sophomore	25–55 hours earned
Junior	56–86 hours earned
Senior	87 or more hours earned
Graduate	Bachelor's degree from accredited institution

Academic Good Standing. For the purpose of retention, academic good standing for degree-seeking students is defined as shown in the "Academic Good Standing" table below.

A student who does not maintain the minimum GPA standard is placed on academic probation or is disqualified. A student on academic probation is in conditional good standing and is permitted to enroll. A student who has been disqualified is not in academic good standing and is not permitted to enroll for fall or spring semesters.

To transfer from one college to another within the university or to be eligible for readmission, a student must have a GPA of 2.00 or higher. The GPA determining good standing is computed on courses taken only at ASU.

Academic Good Standing

Total Earned Hours	Minimum Cumulative GPA
24 or fewer	1.60
25–55	1.75
56 or more	2.00

For purposes of retention or transfer, an individual college may set higher GPA standards; otherwise, the university standards prevail. See the college sections of this catalog or contact the college deans' offices for statements regarding college retention standards.

Meeting Basic Competencies. New students are required to have completed a specific number of courses in the areas of American history, English, laboratory science, mathematics, social science, fine arts and foreign language. Students who are exempt from these requirements include students who have completed an Arizona General Education Curriculum (AGEC) or an associate degree, students admitted by GED, and students who are 22 years of age or older by the first day of the semester of admission. An admitted student who needs to meet competencies in one or more of these areas must satisfy the requirement within one year of the beginning of the student's first semester at ASU. Subject competencies in each area may be met by earning a grade of "D" or higher at ASU in an appropriate course(s) as listed in the "Basic Competencies" table, page 72.

Appealing Basic Competencies. A student who has not met all basic competencies at the end of one calendar year after the student's initial date of enrollment is not permitted to continue at ASU. Each student is notified that he or she may not register or, if already registered, that the registration has been canceled.

A student wishing to appeal the dismissal should submit a petition through his or her college. The colleges have three options in reviewing these appeals:

1. extending the student's end semester to allow one additional semester to complete the required course work;
2. allowing the student to substitute a course not currently approved to fulfill a competency area when an error has been made in advising or for other just causes; or
3. denying the petition.

College actions are forwarded to the Office of the Registrar for processing.

Dean's List. Undergraduate students who earn 12 or more graded semester hours ("A," "B," "C," "D," or "E") during a semester in residence at ASU with a GPA of 3.50 or higher are eligible for the Dean's List. A notation regarding Dean's List achievement appears *only* on the final grade report available online at www.asu.edu/registrar.

Satisfactory Academic Progress. The university is required to publish and enforce standards of satisfactory academic progress for certain students (e.g., student athletes, students receiving financial aid, and students receiving veterans benefits).

Certification of satisfactory progress for student athletes is verified by the academic advisor and the dean's designee

Basic Competencies

Area	ASU Courses That May Be Used to Meet Basic Competencies
American history	Any one course: HST 109, 110
English	Any one course: ENG 101, 105, 107; WAC 101, 107
Fine arts	Any undergraduate three-semester-hour course offered in the Herberger College of Fine Arts
Foreign language	Student must complete through the 102, 108, or 111 course level of any foreign language course.
Laboratory science*	
Chemistry	Any one course: CHM 101, 107, 113, 114, 117
Earth sciences	Any numbered selection: 1. GLG 101 and 103 2. GLG 110 and 111 3. GLG 105 4. GPH 111 5. ERS 130
Life sciences	
Physics	Any one course: BIO 100, 113, 120, 181, 182, 201; PLB 108 Any numbered selection: 1. AST 111 and 113 2. AST 112 and 114 3. PHS 110 4. PHY 101 5. PHY 111 and 113 6. PHY 112 and 114 7. PHY 121 and 122 8. PHY 131 and 132
Mathematics	Any one course: MAT 114, 117, 119, 170, 210, 260, 270, 290
Social science	Any one course: ASB 102; ECN 111, 112; GCU 102, 121, 141; HST 102, 103, 104; PGS 101; POS 101, 110, 150, 160; SOC 101

* The laboratory science requirement is designed to demonstrate competency in two separate laboratory science areas. For example, if one lab science competency has been met in life sciences through high school course work, the ATP biology achievement test, or college course work, the second lab science course must be selected from chemistry, earth sciences, or physics.

for certifying satisfactory progress. Certification of satisfactory progress for students receiving financial aid or veterans benefits is verified by Student Financial Assistance or the Veterans Services Section respectively. Students should contact their advisors or the appropriate office for additional information on satisfactory progress requirements.

Probation. A student's college assumes responsibility for enforcing academic standards and may place any student on probation who has failed to maintain good standing as previously defined. For purposes of probation and retention, an individual college may set higher GPA standards. A student on academic probation is required to observe any rules or limitations the college may impose as a condition for retention.

Disqualification. A student who is placed on probation at the end of a semester is subject to disqualification by the college at the end of the following semester if the conditions imposed for retention are not met.

Disqualification is exercised at the discretion of the college and becomes effective on the first day of the semester following college action. *A disqualified student is notified by the dean of the college or the Office of the Registrar and is not allowed to register in a fall or spring semester at the university until reinstated.* A student who has been disqualified may appeal to the college standards committee. A student who is disqualified may not attend as a nondegree student.

Reinstatement. If a student with a GPA of 2.00 or greater has been disqualified by one college and seeks to transfer to another college at ASU, the student may apply at the Readmissions Section (SSV 114) or directly to the college to which the student wishes and is qualified to transfer.

To be reinstated into an ASU college other than the disqualifying college, the student must submit an application for reinstatement to the University Undergraduate Admissions Board through the Readmissions Section of the Office of the Registrar.

To be reinstated into the same college from which the student was disqualified, the student must submit an application for reinstatement to the disqualifying college. When reinstatement includes readmission, application must be made to the Readmissions Section of the Office of the Registrar.

Reinstatement Appeals. A student wishing to appeal the decision of the standards committee of a college may submit an appeal to the University Undergraduate Admissions Board. The decision of the board is final.

Academic Integrity. The highest standards of academic integrity are expected of all students. The failure of any student to meet these standards may result in suspension or expulsion from the university or other sanctions as specified in the University Student Academic Integrity Policy. Violations of academic integrity include, but are not limited to, cheating, fabrication, tampering, plagiarism, or facilitating such activities. The University Student Academic Integrity Policy is available from the Office of the Senior Vice Presi-

dent and Provost and from the deans of the individual colleges.

Suspension or Expulsion for Academic Dishonesty. All decisions relating to expulsion or suspension that are concerned with academic dishonesty are the sole prerogative of the dean of the school or college in which the student has been admitted. These decisions of suspension or expulsion can be appealed in accordance with established university procedures. Application for reinstatement may be made to any of the academic units within the university after the specified period of suspension. Merely having remained in a suspended status for a period of time does not, in itself, constitute a basis for reinstatement.

Student Records

Family Educational Rights and Privacy Act of 1974

The Federal Family Educational Rights and Privacy Act of 1974, also known as the Buckley Amendment or FERPA, sets forth the requirements governing the protection of the privacy of educational records of students who are or have been in attendance at ASU.

Definitions

Eligible Student. For the purpose of this act, an *eligible student* is defined as any individual formally admitted to and enrolled at ASU.

Record. The term *record* includes any information or data recorded in any medium, including, but not limited to, handwriting, print, tapes, film, microfilm, microfiche, and electronic means.

Types of Information

Education Record. The term *education record* refers to those records directly related to a student and maintained by an education institution. Two types of education records are subject to the provisions of this act: (1) directory information and (2) personally identifiable information. The term does not include those records specifically excluded by Section 99.3 of the privacy act.

Directory Information. The term *directory information* includes the following student information: name, local, permanent and ASU e-mail addresses, local telephone number, date and place of birth, residency status, academic level, major field of study, college of enrollment, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student.

Personally Identifiable Information. The term *personally identifiable information* includes all information not defined as directory information. This includes, but is not limited to, the name of a student's parent or other family member(s), a personal identifier such as the student's ASU ID number or Social Security number, a list of personal characteristics, or other information that would make the student's identity easily traceable and any information, including directory information, that the student has indicated not to be released.

Access to Records

An eligible student may inspect and review his or her own education records. Some form of photo identification must be displayed before access to education records is allowed.

Directory information may be released to anyone without consent of the student unless the student has indicated otherwise. Students may request that this information not be released by completing a form in the Office of the Registrar. A request to withhold this information excludes the student from being listed in the annual directory only if the request is submitted to the Office of the Registrar before the end of the third week of the fall semester.

All other education records that contain personally identifiable information may not be released without the written consent of the student. A parent of a dependent student may challenge denial of such access by producing the most current copy of Internal Revenue Form 1040. If that form lists the student in question as a dependent, the parent is required to sign an affidavit that affirms that the student is his or her dependent. The affidavit is retained by the Office of the Registrar. Upon receipt of the affidavit, the university may make student records available to the parent for the rest of that calendar year as specified under the Buckley Amendment.

Students may grant access to parents or agencies by completing a form in the Office of the Registrar.

Location of Policy and Records

The custodian of education records at ASU is the Office of the Registrar. Copies of this policy are available in the following offices: Reserve sections of Hayden Library and the Noble Science and Engineering Library, the Office of the Registrar, Undergraduate and Graduate Admissions, and Student Life. The Office of the Registrar also maintains a directory that lists all education records maintained on students by ASU.



Inside the Memorial Union

Tim Trumble photo

University Graduation Requirements

UNIVERSITY REQUIREMENTS

All students enrolled in a baccalaureate degree program must fulfill the following university requirements to graduate.

Credit Requirements

A minimum of 120 semester hours is required for graduation with a baccalaureate degree. A minimum of 45 semester hours in upper-division courses is required for graduation. Some programs may require more than 45 upper-division semester hours for graduation; refer to college graduation requirements for the specific number required.

Not more than 60 semester hours in independent learning courses and/or earned by comprehensive examination (including Advanced Placement, College-Level Examination Program, and International Baccalaureate Diploma/Certificate exams) are accepted for credit toward the baccalaureate degree.

Grade Point Requirement

A minimum cumulative grade point average of 2.00 for all courses taken at ASU is required to graduate with a baccalaureate degree.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 semester hours of approved course work. (See “General Studies,” page 78.) For General Studies courses, see the “General Studies Courses” table, page 81, the course descriptions, the *Schedule of Classes*, and the *Summer Sessions Bulletin*.

Students transferring from Arizona community colleges with a certified completion of the appropriate Arizona General Education Curriculum (AGEC) will have satisfied all lower-division General Studies requirements of the baccalaureate degree with which the AGEC articulates. For more details regarding the different versions of AGEC, refer to www.abor.asu.edu/4_special_programs/atass/student/agecURLs.htm.

General Studies Mathematics Requirement

All undergraduate degree-seeking students are expected to fulfill the university’s mathematics requirement by the time they have accumulated 30 hours of credit in residence at ASU. Any student who has more than 30 hours of credit and has not fulfilled the mathematics requirement must enroll in a mathematics course or an appropriate prerequisite course and continue to do so every semester until the mathematics requirement is met. A waiver may be granted for continuous enrollment if there are scheduling conflicts detrimental to the student’s academic progress.

First-Year Composition Requirement

Completion of both ENG 101 and 102 or ENG 105 with a grade of “C” or higher is required for graduation from ASU in any baccalaureate program. International students from non-English-speaking countries may meet the First-Year Composition requirement by completing ENG 107 and 108 with a grade of “C” or higher.

New or Transfer Students. Before new students or transfer students can register for the first time at ASU, they must determine what courses to take to complete the university First-Year Composition requirement; the students must then enroll immediately in composition courses and continue to do so every term until composition requirements are met. *Colleges may grant waivers to the immediate and continual enrollment requirement when there are scheduling conflicts detrimental to the student’s academic progress.* Transfer students from other Arizona colleges or universities can determine the acceptability of their composition courses by referring to the *Course Applicability System* in consultation with an academic advisor. Composition courses transferred from out-of-state institutions must be evaluated and approved by the Composition Office.

The transfer student must file an application in the student’s college for Equivalency of First-Year Composition Requirements, along with a transcript and catalog descriptions of the composition courses to be transferred. The application, available in each college, should be filed immediately upon transfer of course work to ASU so that the student is able to enroll in an additional composition course, if required to do so.

For more information, the student should go to the Composition Office in LL 314.

Resident Credit Requirement

Resident credit refers to a course that is offered in a regular semester, winter session, intersession, or summer session. Credit earned through comprehensive examinations is also included when calculating ASU resident hours. Credit earned through independent learning, advanced placement, the College-Level Examination Program, or an International Baccalaureate Diploma/Certificate are excluded when calculating ASU resident hours.

Campus Resident Credit Requirement. Every candidate for the baccalaureate degree is required to earn a minimum of 30 semester hours in resident credit courses at the ASU campus from which the student will graduate.

Guidelines for Determination of Catalog Year

The *General Catalog* is published annually. Department, school, division, college, and university requirements may change and are upgraded often. In determining graduation requirements, an undergraduate student may use only one edition of the *General Catalog* but may elect to follow any subsequent catalog. Students maintaining continuous enrollment at any public Arizona community college or university may graduate according to the requirements of the catalog in effect at the time of initial enrollment or according to the requirements of any single catalog in effect during subsequent terms of continuous enrollment. Students may maintain continuous enrollment whether attending a single public community college or university in Arizona or transferring among public institutions in Arizona while pursuing their degrees.

Students transferring among Arizona public higher education institutions must meet the admission, residency, and

Continuous Enrollment

Student's Activity	Semester/Year	Status
Example A		
Admitted and earned course credit at an Arizona community college	Fall 2000	Active
Continued at an Arizona community college	Spring 2001	Active
	Fall 2001	
Transferred to an Arizona university	Spring 2002	Student enrolled under 2000–01 or any subsequent catalog
Example B		
Admitted and earned course credit at an Arizona community college	Fall 1997	Active
Enrolled but earned all “Ws” or “Es”	Spring 1998	Inactive
Enrolled in audit courses only	Fall 1998	Inactive
Nonattendance	Spring 1999	Inactive
Transferred to an Arizona university	Fall 1999	Student enrolled under 1999–2000 or any subsequent catalog
Example C		
Admitted and earned course credit at an Arizona community college	Fall 1997	Active
Nonattendance	Spring 1998	Inactive
	Fall 1998	
	Spring 1999	
Readmitted and earned course credit at an Arizona community college	Fall 1999	Active
Transferred to an Arizona university	Spring 2000	Student enrolled under 1999–2000 or any subsequent catalog
Example D		
Admitted and earned course credit at an Arizona community college	Fall 1996	Active
Nonattendance	Spring 1997	Inactive
Readmitted and earned course credit at an Arizona community college	Summer 1997	Active
Nonattendance	Fall 1997	Inactive
	Spring 1998	
Transferred to an Arizona university	Fall 1998	Student enrolled under 1996–98 or any subsequent catalog
Example E		
Admitted and earned course credit at an Arizona community college	Summer 1998	Active
Continued at an Arizona community college	Fall 1998	Active
	Spring 1999	
Nonattendance	Fall 1999	Inactive
Readmitted and earned course credit at an Arizona community college	Spring 2000	Active
Transferred to an Arizona university	Summer 2000	Student enrolled under 1998–99 or any subsequent catalog

all curricular and academic requirements of the degree-granting institution.

1. A semester in which a student earns course credit is counted toward *continuous* enrollment. Noncredit courses, audited courses, failed courses, or courses from which the student withdraws do not count toward the determination of *continuous* enrollment for catalog purposes. See examples A and B in the “Continuous Enrollment” table, on this page.
2. Students who do not meet the minimum enrollment standard stipulated in number 1 during three consecutive semesters (fall/spring/fall or spring/fall/spring) and the intervening summer term at any public Arizona community college or university are no longer considered continuously enrolled. (Note that students are not obligated to enroll and earn course credit during summer terms, but summer enrollment may be used to maintain continuous enrollment status.) These students must meet requirements of the public Arizona community college or university catalog in effect at the time they are readmitted or of any single catalog in effect during subsequent terms of *continuous* enrollment after readmission. See examples C and D in the “Continuous Enrollment” table, on this page.
3. Students admitted or readmitted to a public Arizona community college or university during a summer term must follow the requirements of the catalog in effect the following fall semester or of any single catalog in effect during subsequent terms of *continuous* enrollment. See example E in the “Continuous Enrollment” table, on this page.
4. In areas of study in which the subject matter changes rapidly, material in courses taken long before graduation may become obsolete or irrelevant. Course work that is more than eight years old is applicable to completion of degree requirements at the discretion of the student’s major department. Departments may accept such course work, reject it, or request that the student revalidate its substance. The

eight-year limit on course work applies except when program accreditation agencies limit the life of course work to fewer than eight years. Departments may also require students to satisfy current major requirements rather than major requirements in earlier catalogs when completing earlier requirements is no longer possible or educationally sound.

5. Enrollment by Arizona community college students in nontransferable courses still constitutes enrollment for purposes of determining whether the student has been continuously enrolled. For example, if a student takes two semesters of cooperative education classes, which are not transferable to the university but constitute *continuous* enrollment at the community college, the university should consider it *continuous* enrollment.
6. Exceptions made by an institution apply only to the institution that made the exception. For example, if the community college departments accepted credit that was more than eight years old, the university department to which the student transfers has the right and the obligation to reevaluate any credit more than eight years old.

Inquiries about these guidelines may be directed to the student's academic advisor.

Declaration of Graduation

Students following the curriculum requirements of the 1996–98 or later catalog editions may be eligible to file a Declaration of Graduation using the Degree Audit Reporting System (DARS).

DARS is an automated process that matches courses a student has completed with the requirements of a particular academic degree program, resulting in a report that shows the student which requirements are satisfied and which requirements remain to be fulfilled, thus providing a guide for efficient selection of courses toward graduation. For example, a student majoring in Biology would request a Degree Audit Report that would show how his or her completed ASU and transfer course work would apply to the Biology degree program.

A student must review his or her degree audit with the academic advisor and submit a Declaration of Graduation within the semester he or she earns the 87th semester hour. Students who have not met the above requirement are prevented from further registration.

Students following the curriculum requirements of the 1994–96 or earlier catalog editions, plus selected students following later catalogs, will follow the Program of Study requirement instead of the Declaration of Graduation. Inquiries about whether to follow the Declaration of Graduation procedure or the Program of Study procedure may be directed to the academic advisor.

Program of Study Requirements

A student following the curriculum requirements of the 1994–96 or earlier catalog editions must file an Undergraduate Program of Study for graduation within the semester the student earns his or her 87th semester hour. The Program of Study guides the student in accomplishing successful completion of degree requirements in a timely manner. Students who have not met the above requirement are prevented from further registration.

Program of Study forms and procedural information are available from the Graduation Section at SSV 140, at any registrar site, or online at www.asu.edu/registrar/forms.

Application for Graduation Requirements

The following steps are required to complete the graduation process:

1. Register for the final semester.
2. Pay the graduation fee at Cashiering Services. Note the deadline dates listed in the "University Calendar," page 14.
3. Submit the fee receipt to the Graduation Section, SSV 140, and apply for graduation. The Degree Audit Report or Program of Study is reviewed at this time and the graduation date and eligibility to graduate are verified.
4. Complete all course work listed on the Degree Audit Report or Program of Study by the graduation date.

For more information about application for graduation requirements at ASU West, contact ASU West Admissions and Records, UCB 120.

Students must comply with the above requirements to graduate.

The Application for Graduation along with the Degree Audit Report or Program of Study is reviewed to verify graduation eligibility.

Petition for Variance from Degree

Any student wishing to have a college or university degree requirement variance must petition the standards committee of the college in which the student is enrolled.

All petitions must originate with the student's advisor. Refer to the college sections of this catalog for college and division, school, or department requirements.

Main Campus Standards Committee. This committee advises the Office of the Senior Vice President and Provost regarding undergraduate student petitions that concern university-wide academic requirements. These requirements include but are not limited to requirements on the amount of transfer credit, graduation requirements, limits on credit by examination, and requirements for a second baccalaureate degree (see "Overview of Graduation Requirements," page 77, and "Second Baccalaureate Degree," page 77). To petition for a variance from such university requirements, the normal department, division, school, and college forms and procedures are used. Only petitions that have been denied at the college level are forwarded to the Main Campus Standards Committee.

OTHER REQUIREMENTS

The separate units of the university, such as colleges, divisions, schools, and departments, have specific requirements for graduation that must be satisfied for a baccalaureate degree. For those requirements, see the appropriate *General Catalog* section. Students are encouraged to consult with an academic advisor in planning a program to ensure that it meets the various requirements. A well-planned program may enable a student to concurrently satisfy a portion of the General Studies requirement together with a portion of a college or major requirement.

OVERVIEW OF GRADUATION REQUIREMENTS

At ASU, students take classes that fulfill four types of requirements. As illustrated in the “Graduation Requirements” diagram on this page, some courses can fulfill two or more types of requirements, but other courses fulfill only one requirement. The total semester hours needed to graduate are represented by the largest circle. The university minimum is 120 semester hours. Some majors, however, require more than 120 semester hours.

Although the three shaded circles are equal in size and the white circle is larger than all three, the total number of semester hours for each type of requirement may vary.

University Requirements. The light gray circle represents university requirements. The General Studies requirement and the First-Year Composition requirement are among the university requirements. For General Studies, a minimum of 35 semester hours in five core and three awareness areas is required. For more information, see “General Studies,” page 78.

College Requirements. The medium gray circle represents college requirements. Some colleges and schools have additional requirements, especially the College of Liberal Arts and Sciences. It is important that you understand the requirements of your college.

Major. The dark gray circle represents the requirements of the major. The semester hours required for a major may be as low as 30 hours or as high as 63 hours.

Electives/Minor. The white circle represents electives and the requirements of a minor. A minor typically adds an additional 18 to 25 semester hours. Though every student must eventually declare a major, a minor is not required. For more information on minors, see “Minors, Certificates, and Interdisciplinary Studies,” page 102. Some courses, while providing semester hours toward graduation, fall outside the shaded circles and are not required in your program for graduation. These courses are electives. Some majors leave no room for electives within the minimum 120 semester hours required to graduate.

GENERAL GRADUATION INFORMATION

Graduation with Academic Recognition. An undergraduate student must have completed at least 60 semester hours of resident credit at ASU to qualify for graduation with academic recognition for a baccalaureate degree.

The cumulative GPA determines the designation, as shown in the “Academic Recognition” table, on this page. The cumulative GPA for these designations is based on only ASU resident course work. For example, ASU independent learning course grades are not calculated in the honors GPA. All designations of graduation with academic recognition are indicated on the diploma and the ASU transcript. Graduation with academic recognition applies only to undergraduate degrees.

A student who has a baccalaureate degree from ASU and is pursuing a second baccalaureate degree at ASU (with a minimum of 30 hours of resident credit) is granted academic recognition on the second degree based on the semester hours earned subsequent to the posting of the first degree. If fewer than 60 semester hours are completed at ASU subsequent to completion of the first ASU degree, the

level of academic recognition can be no higher than that obtained on the first degree. If 60 or more semester hours are completed at ASU after completion of the first ASU degree, the level of academic recognition is based on the GPA earned for the second ASU degree. Inquiries about graduation with academic recognition may be directed to the Graduation Section, 480/965-3256.

Academic Recognition

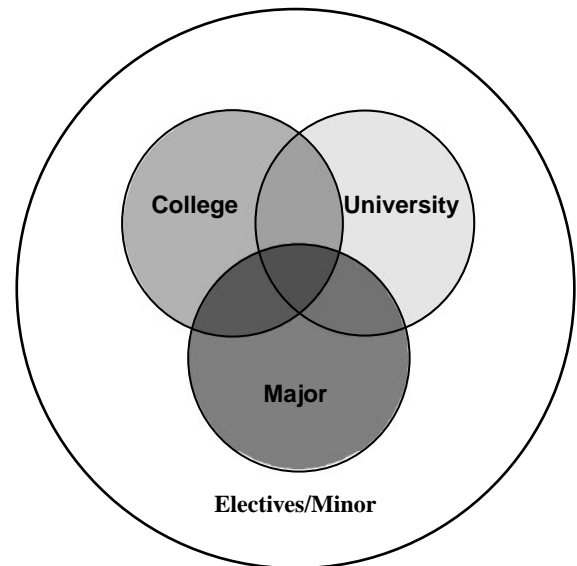
Cumulative GPA	Designation
3.40–3.59	<i>cum laude</i>
3.60–3.79	<i>magna cum laude</i>
3.80–4.00	<i>summa cum laude</i>

Second Baccalaureate Degree. The student seeking a second baccalaureate degree must meet admission criteria for that degree. After conferral of the first degree, a minimum of 30 semester hours in resident credit must be successfully completed at the ASU campus from which the second baccalaureate degree will be awarded. The student must meet all degree and university requirements of the second degree.

Concurrent Degrees. More than one baccalaureate degree may be pursued concurrently if prior approval is given by the standards committee(s) of the college(s) offering the degrees. Students may receive concurrent degrees if they meet the minimum requirements for both degrees.

Graduate Degrees. See “Graduate College,” page 498, and “College of Law,” page 312, for graduate degrees offered and statements of requirements for graduate degrees. A *Graduate Catalog* may be obtained from the Graduate College or the ASU Bookstore.

Graduation Requirements



General Studies

A baccalaureate education should prepare students for a particular profession or advanced study and for constructive and satisfying personal, social, and civic lives. In addition to depth of knowledge in a particular academic or professional discipline, students should also be broadly educated and develop the general intellectual skills they need to continue learning throughout their lives. Thus, the General Studies requirement complements the undergraduate major by helping students gain mastery of critical learning skills, investigate the traditional branches of knowledge, and develop the broad perspective that frees one to appreciate diversity and change across time, culture, and national boundaries.

Critical learning skills include proficiency in the use of language, mathematics, and quantitative methods as tools for acquiring, renewing, creating, and communicating knowledge. A broad education includes an understanding of the methods and concerns of traditional branches of knowledge—the arts and humanities, the social sciences, and the natural sciences. Developing perspective requires historical, global, and cross-cultural examination of knowledge of all kinds.

To help students achieve these educational goals, the General Studies Program includes five *core areas* and three *awareness areas*. The five *core areas* help students acquire critical lifelong learning skills and guide their exploration of the traditional branches of knowledge:

1. literacy and critical inquiry;
2. mathematics studies;
3. humanities and fine arts;
4. social and behavioral sciences; and
5. natural sciences.

The three *awareness areas* promote appreciation of cultural diversity within the contemporary United States, develop an international perspective, and foster an understanding of current human events through study of the past:

1. cultural diversity in the United States;
2. global awareness; and
3. historical awareness.

The courses approved by the ASU Main General Studies Council (for ASU Main and ASU East) for meeting the General Studies requirement are noted in the “General Studies Courses” table, page 81; in the course descriptions; and in the *Schedule of Classes* each academic term. The courses approved by the ASU West General Studies Council can be found in the *ASU West Catalog* and in the *Schedule of Classes*.

Meeting the General Studies Requirement

All students enrolled in a baccalaureate degree program must successfully complete a minimum of 35 semester hours of approved General Studies courses. Many General Studies courses are approved as satisfying more than one

requirement. The following conditions govern the application of courses toward the General Studies requirement.

1. A single course may be used to satisfy one core area and a maximum of two awareness area requirements.
2. A single course may be used to satisfy a maximum of two awareness area requirements.
3. A single course cannot be used to satisfy two core area requirements, even if it is approved for more than one core area.

There is no limit to the number of advanced placement (AP) or College-Level Examination Program (CLEP) credits that can be used to meet the General Studies requirement; see “Special Programs for Advanced Placement and Credit,” page 60. However, the natural sciences (SQ and SG) and literacy and critical inquiry (L) portions of the General Studies requirement are not satisfied by CLEP.

FIVE CORE AREAS

Literacy and Critical Inquiry (L)

Literacy is competence in written and oral discourse; critical inquiry is the gathering, interpretation, and evaluation of evidence. The literacy and critical inquiry requirement helps students sustain and extend their ability to reason critically and communicate clearly through language.

L Requirement (Six Semester Hours). Students must complete six semester hours from courses designated as L, at least three semester hours of which must be chosen from approved upper-division courses, preferably in their major. Students must have completed ENG 101, 107, or 105 to take an L course.

Mathematical Studies (MA and CS)

This core area has two categories: (1) Mathematics (MA) is the acquisition of essential skill in basic mathematics and requires the student to complete a course in college mathematics or college algebra or to demonstrate a higher level of skill by completing a course for which college algebra is a prerequisite; and (2) computer/statistics/quantitative applications (CS) applies mathematical reasoning and requires students to complete a course in either the use of statistics/quantitative analyses or the use of the computer to assist in serious math analytical work.

MA and CS Requirement (Six Semester Hours). This requirement has two parts: (1) at least three semester hours must be selected from courses designated MA, and at least three semester hours must be selected from courses designated CS; and (2) all students are expected to fulfill the MA requirement by the time they accumulate 30 hours of credit in residence at ASU. Any student who has more than 30 hours of resident ASU credit and has not fulfilled the mathematics (MA) requirement must enroll in an MA course or an appropriate prerequisite and continue to do so every semester until the mathematics requirement is met. College officers may grant waivers to the immediate and continual

enrollment requirement only when there are scheduling conflicts detrimental to the student's academic progress.

Humanities and Fine Arts (HU)

The humanities and fine arts explore, through critical and creative activities, questions of human experience and expression as these articulate the human condition and reflect basic human values. Although differing in method, both probe the universality of human experience and promote a broader and deeper understanding of an individual's relationship to self, culture, and nature.

HU Requirement. The requirements for humanities and fine arts (HU) are combined with the requirements for social and behavioral sciences (SB). See "Combined HU and SB Requirement," on this page.

Social and Behavioral Sciences (SB)

The social and behavioral sciences provide scientific methods of inquiry and empirical knowledge about human behavior, both within society and individually. The forms of study may be cultural, economic, geographic, historical, linguistic, political, psychological, or social. The courses in this area address the challenge of understanding the diverse natures of individuals and cultural groups who live together in a world of diminishing economic, linguistic, military, political, and social distance.

Combined HU and SB Requirement (15 Semester Hours)

A total of 15 semester hours must be completed in the following two core areas: (1) humanities and fine arts (HU) and (2) social and behavioral sciences (SB). Two conditions must be satisfied: (1) six semester hours must be taken in one of these two core areas and nine hours in the other core area; and (2) three of the 15 semester hours must be at the upper-division level.

Natural Sciences (SQ and SG)

The natural sciences help students appreciate the scope and limitations of science and its contributions to society. Natural science areas of study include anthropology, astronomy, biology, biochemistry, chemistry, experimental psychology, geology, microbiology, physical geography, physics, and plant biology. Knowledge of methods of scientific inquiry and mastery of basic scientific principles and concepts are stressed, specifically those that relate to matter and energy in living and nonliving systems. Firsthand exposure to scientific phenomena in the laboratory is important in developing and understanding the concepts, principles, and vocabulary of science.

General Studies courses that satisfy the natural science requirement are given one of two classifications: quantitative and general.



Cady Mall

Natural Science-Quantitative (SQ). These laboratory courses include a substantial introduction to the fundamental behavior of matter and energy in physical and biological systems.

Natural Science-General (SG). These laboratory courses cover aspects of scientific inquiry that lend themselves to more qualitative or descriptive discussions of science.

SQ and SG Requirement (Eight Semester Hours). Eight semester hours of courses designated SQ or SG must be selected. Of these, at least four semester hours must be taken from the SQ category.

THREE AWARENESS AREAS

Students must complete courses that satisfy each of the three awareness areas. Courses that are listed for a core area and one or more awareness areas may satisfy each of these requirements concurrently.

Cultural Diversity in the United States (C)

The objective of the cultural diversity requirement is to promote awareness and appreciation of cultural diversity within the contemporary United States. The objective is accomplished through the study of the cultural, social, or scientific contributions of women and minority groups, examination of their experiences in the United States, or exploration of successful or unsuccessful interactions between and among cultural groups. Awareness of cultural diversity and its multiple sources can illuminate the collective past, present, and future and can help students to achieve greater mutual understanding and respect.

Global Awareness (G)

The objective of the global awareness requirement is to help students recognize the need for an understanding of the values, elements, and social processes of cultures other than the culture of the United States. The global awareness area includes courses that recognize the nature of other contemporary cultures and the relationship of the American cultural system to generic human goals and welfare.

Historical Awareness (H)

The objective of the historical awareness requirement is to help students develop knowledge of the past that can be useful in shaping the present and future. History is present in the languages, art, music, literature, philosophy, religion, and the natural sciences, as well as in the social science traditionally called history.

Transfer Credit

The Arizona General Education Curriculum (AGEC), offered by the Arizona community colleges, is composed of 35 semester hours of lower-division general education course work. Students who complete the AGEC have completed the ASU First-Year Composition requirement and all lower-division portions of the General Studies requirement. Students must still take six upper-division semester hours (three for L and three for SB or HU) to complete the ASU

General Studies requirement. If students transfer from Arizona community colleges without completing AGEC or from other accredited postsecondary institutions, they receive credit for General Studies based on course-by-course equivalency. See “Arizona General Education Curriculum (AGEC),” page 58.

College or School, and Major Requirements

In addition to General Studies requirements, students must also complete college or school, and major requirements. Students are encouraged to work with their academic advisors to develop a program of study that efficiently meets all graduation requirements. A well-planned program may enable a student to concurrently satisfy requirements at the university, college, or school levels, and within their major.

GENERAL STUDIES COURSES

The ASU Main and ASU East courses in the “General Studies Courses” table, page 81, satisfy the requirements of the five core areas and three awareness areas. General Studies courses are regularly reviewed. Since courses are occasionally added to and deleted from the list, students should always consult the *Schedule of Classes* each semester to see which courses currently meet the General Studies requirement.

A student receives the General Studies credit a course carries in the semester in which the course is taken.

The “Key to General Studies Credit Abbreviations” table, on this page, defines the abbreviations used. General Studies courses are also identified following course descriptions.

The campus codes “M” (for ASU Main) and “W” (for ASU West) identify the campus that maintains academic control over the course (i.e., course content, registration restrictions, General Studies designations, and other curricular matters). The campus code is not used in the catalogs but appears in the *Schedule of Classes*, on transcripts, and other enrollment and registration records.

Key to General Studies Credit Abbreviations

Code	Description
L	Literacy and critical inquiry core courses
MA	Mathematics core courses
CS	Computer/statistics/quantitative applications core courses
HU	Humanities and fine arts core courses
SB	Social and behavioral sciences core courses
SQ	Natural science—quantitative core courses
SG	Natural science—general core courses
C	Cultural diversity in the United States awareness courses
G	Global awareness courses
H	Historical awareness courses
/	Or
,	And

General Studies Courses

		L	MA	CS	HU	SB	SQ	SG	C	G	H
---	493	Honors Thesis (See "Honors Courses," page 52. Only three semester hours may fulfill L requirement.)	L								
ACC	330	Enterprise Process Analysis and Design	L								
	430	Taxes and Business Decisions	L								
AES	301	Air Force Leadership Studies I	L								
	303	Air Force Leadership Studies II	L								
	401	National Security Affairs	L								
AFH	202	Art of Africa, Oceania, and the Americas (Cross-listed as ARS 202)			HU					G	H
	210	Introduction to Ethnic Studies in the U.S. (Cross-listed as APA 210/CCS 210)							C		
	225	African American Religion (Cross-listed as REL 225)			HU				C		
	322	Malcolm and Martin (Cross-listed as REL 322)			HU				C		
	323	Black Religion: A Biographical Approach (Cross-listed as REL 323)			HU				C		
	333	American Ethnic Literature (Cross-listed as ENG 333)	L						C		
	347	Jazz in America (Cross-listed as MUS 347)			HU						
	353	African American Literature: Beginnings Through the Harlem Renaissance (Cross-listed as ENG 353)	L		HU				C		
	354	African American Literature: Harlem Renaissance to the Present (Cross-listed as ENG 354)	L		HU				C		
AFR	210	Introduction to African American Studies							C		
	263	Elements of Intercultural Communication (Cross-listed as COM 263)				SB			C	G	
	317	Genes, Race, and Society				SB			C		H
	321	Wealth Distribution and Poverty (Cross-listed as JUS 321)				SB			C		
	371	Language, Culture, and Communication (Cross-listed as COM 371)				SB			C	G	
	460	Race, Gender, and Media (Cross-listed as MCO 460)							C		
	463	Intercultural Communication Theory and Research (Cross-listed as COM 463)				SB				G	
	493	Honors Thesis	L								
AFS	202	Ethnic Relations in the United States (Cross-listed as ASB 202)							C		H
	363	African American History to 1865 (Cross-listed as HST 333)				SB			C		H
	364	African American History Since 1865 (Cross-listed as HST 334)				SB			C		H
	366	African Civilization Before 1850 (Cross-listed as ASB 366)				SB				G	H
	370	Family, Ethnic, and Cultural Diversity (Cross-listed as FAS 370)				SB			C		
	466	Peoples and Cultures of Africa (Cross-listed as ASB 466)				SB				G	H
AGB	161	Computer Applications for Agribusiness Industries		CS							
	250	World Food Dynamics								G	
	258	International Agribusiness								G	
	351	Management Science		CS							
	360	Agribusiness Statistics		CS							
	414	Agribusiness Analysis	L								
	450	International Agricultural Development								G	
	455	Resource Management				SB					
	456	World Agricultural Resources								G	
AIS	180	Introduction to American Indian Studies							C		
	280	American Indian Law and Society							C		
AMT	308	Air Transportation								G	
ANP	236	Introduction to Computer Modeling		CS							
APA	200	Introduction to Asian Pacific American Studies			HU	SB			C		
	210	Introduction to Ethnic Studies in the U.S. (Cross-listed as AFH 210/CCS 210)							C		
	310	Asian Pacific American Arts and Cultures			HU				C		
	315	Asian Pacific American Literature			HU				C		
	340	Asian Pacific Americans and Media			HU				C		
	360	Asian Pacific American Experience			HU	SB			C		
	450	Asian Pacific American Contemporary Issues			HU	SB			C		
APH	100	Introduction to Environmental Design (Cross-listed as DSC 100/PUP 100)			HU					G	H
	200	Introduction to Architecture			HU					G	
	300	World Architecture I/Western Cultures			HU					G	H
	301	World Architecture II/Eastern Cultures								G	
	304	American Architecture			HU						
	305	Contemporary Architecture			HU						

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
313 History of Western Architecture I	L			HU						
314 History of Western Architecture II	L			HU						
411 History of Landscape Architecture (Cross-listed as PLA 310)										H
414 History of the City (Cross-listed as PUP 412)										H
441 Ancient Architecture				HU						
443 Renaissance Architecture				HU						
444 Baroque Architecture				HU						
446 20th-Century Architecture I				HU						
447 20th-Century Architecture II				HU						
ARA 311 Art Appreciation and Human Development				HU						
488 Understanding Art	L			HU						
ARB 201 Intermediate Arabic									G	
202 Intermediate Arabic									G	
ARS 100 Introduction to Art				HU						
101 Art of the Western World I				HU						H
102 Art of the Western World II				HU						H
201 Art of Asia				HU					G	H
202 Art of Africa, Oceania, and the Americas (Cross-listed as AFH 202)				HU					G	H
250 History of Photography				HU						
300 Introduction to Art				HU						
302 Art of Africa, Oceania, and the Americas				HU					G	H
340 Art in America				HU						H
400 History of Printmaking				HU						H
402 Art of Ancient Egypt				HU						H
404 Greek Art				HU						H
406 Roman Art				HU						H
410 Early Christian and Byzantine Art				HU						
412 Early Medieval Art				HU						H
414 Romanesque Art				HU						H
416 Gothic Art				HU						
418 Renaissance Art in Northern Europe				HU						
420 Early Renaissance Art in Italy				HU						H
422 Italian High Renaissance Art and Mannerism				HU						
424 Italian Baroque Art				HU						H
426 Art of the 17th Century in Northern Europe				HU						H
428 Art of the 18th Century				HU						H
430 Art of Spain and Its Colonies				HU						H
432 19th-Century French Art and Culture				HU						H
434 From Courbet to Cézanne: History of European Art 1860–WWI				HU						
436 Art at the Turn of the Century: 1885–1914				HU						
438 Art of the 20th Century I				HU						H
439 Art of the 20th Century II				HU						H
442 Critical Issues in American Painting I				HU						
443 Critical Issues in American Painting II				HU						
444 Modern American Art, 1900–1945				HU						H
458 Critical Theories in the Visual Arts				HU						
462 Pre-Columbian Art I				HU						H
463 Pre-Columbian Art II				HU						H
465 Native North American Art				HU						H
466 Native American Art of the Southwest				HU				C		H
468 Art of the Arctic and Northwest Coast				HU						
469 Mexican Art				HU						H
472 Art of China				HU						
473 Art of Japan				HU						
475 Chinese Painting				HU						
480 Research Methods	L									
485 Women in the Visual Arts	L									
ART 346 3D Computer Imaging and Animation			CS							
470 Computer Animation Portfolio			CS							

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
ASB 102 Introduction to Cultural and Social Anthropology					SB				G	
202 Ethnic Relations in the United States (Cross-listed as AFS 202)								C		H
211 Women in Other Cultures				HU	SB				G	
222 Buried Cities and Lost Tribes: Our Human Heritage				HU	SB				G	H
223 Buried Civilizations of the Americas				HU	SB				G	H
231 Archaeological Field Methods							SG			
240 Introduction to Southeast Asia (Cross-listed as GCU 240/HST 240/POS 240/REL 240)									G	
242 Asian American Experiences: An Anthropological Perspective	L							C		
250 Anthropology Topics	L									
302 Ethnographic Field Study in Mexico	L				SB				G	
311 Principles of Social Anthropology					SB					
321 Indians of the Southwest	L				SB			C		H
322 Indians of Mesoamerica					SB				G	
323 Indians of Latin America					SB				G	
324 Peoples of the Pacific									G	
325 Peoples of Southeast Asia									G	
326 Human Impacts on Ancient Environments					SB					H
330 Principles of Archaeology					SB					
333 New World Prehistory	L				SB					
335 Prehistory of the Southwest					SB			C		H
337 Pre-Hispanic Civilization of Middle America				HU	SB				G	H
338 Archaeology of North America					SB					H
351 Psychological Anthropology					SB					
353 Death and Dying in Cross-Cultural Perspective				HU	SB				G	
355 Shamanism, Healing, and Consciousness				HU	SB					
361 Old World Prehistory I										H
362 Old World Prehistory II										H
366 African Civilization Before 1850 (Cross-listed as AFS 366)					SB				G	H
400 Cultural Factors in International Business									G	
412 History of Anthropology	L				SB					
416 Economic Anthropology	L				SB					
462 Medical Anthropology: Culture and Health								C		
466 Peoples and Cultures of Africa (Cross-listed as AFS 466)					SB				G	H
471 Introduction to Museums	L									
480 Introduction to Linguistics					SB					
481 Language and Culture					SB					
483 Sociolinguistics and the Ethnography of Communication					SB					
ASE 485 Engineering Statistics			CS							
ASM 101 Bones, Stones, and Human Evolution					SB					
301 Peopling of the World					SB					
342 Human Biological Variation							SG			
344 Fossil Hominids										H
348 Social Issues in Human Genetics					SB					
452 Dental Anthropology							SG			
455 Primate Behavior Laboratory	L									
AST 111 Introduction to Solar Systems Astronomy (if credit also earned in AST 113)						SQ				
112 Introduction to Stars, Galaxies, and Cosmology (if credit also earned in AST 114)						SQ				
113 Astronomy Laboratory I (if credit also earned in AST 111 or 321)						SQ				
114 Astronomy Laboratory II (if credit also earned in AST 112 or 322)						SQ				
321 Introduction to Planetary and Stellar Astrophysics (if credit also earned in AST 113)						SQ				
322 Introduction to Galactic and Extragalactic Astrophysics (if credit also earned in AST 114)						SQ				
BCH 467 Analytical Biochemistry Laboratory	L									
BIO 100 The Living World						SQ				
120 Human Physiology							SG			
181 General Biology						SQ				
182 General Biology							SG			
193 The Nature of Biological Science						SQ				

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
201 Human Anatomy and Physiology I							SG			
241 Human Genetics							SG			
302 Cancer and Heart Disease	L									
303 Radiation and Life	L									
304 Radiation Medicine and Biology	L									
316 History of Biology: Conflicts and Controversies (Cross-listed as HPS 330)										H
318 History of Medicine (Cross-listed as HPS 331)										H
319 Environmental Science (Nonmajor) (Cross-listed as PLB 320)								G		
321 Introductory Ecology Laboratory	L									
343 Genetic Engineering and Society	L									
406 Computer Applications in Biology (Cross-listed as PLB 432)			CS							
410 Techniques in Wildlife Conservation Biology	L									
415 Biometry			CS							
416 Professional Values in Science (Cross-listed as HPS 410)	L									
419 Research Colloquium in Biology and Society	L									
426 Limnology	L									
428 Biogeography	L									
435 Research Techniques in Animal Behavior	L									
446 Principles of Human Genetics	L									
470 Systematic Zoology	L									
493 Honors Thesis	L									
BIS 301 Foundations of Interdisciplinary Studies	L									
402 Senior Seminar	L									
BME 201 Introduction to Bioengineering (Cross-listed as STE 201)	L									
202 Global Awareness Within Biomedical Engineering Design	L			HU						
413 Biomedical Instrumentation (if credit also earned in BME 423)	L									
423 Biomedical Instrumentation Laboratory (if credit also earned in BME 413)	L									
BUS 301 Fundamentals of Management Communication	L									
451 Business Research Methods	L									
CCS 101 Introduction to Chicana and Chicano Studies								C		
111 Introduction to Chicana and Chicano Culture								C		
210 Introduction to Ethnic Studies in the U.S. (Cross-listed as AFH 210/APA 210)								C		
300 Chicana and Chicano Culture and Society								C		
CDE 232 Human Development					SB					
430 Infant/Toddler Development in the Family					SB					
437 Observational and Naturalistic Methods of Studying Children	L				SB					
CEE 486 Integrated Civil Engineering Design	L									
CET 150 Digital Systems I			CS							
CHE 352 Transport Laboratories	L									
461 Process Control			CS							
CHI 201 Intermediate Chinese									G	
202 Intermediate Chinese									G	
207 Chinese for International Professions II									G	
313 Advanced Chinese									G	
314 Advanced Chinese									G	
321 Chinese Literature	L			HU						
322 Chinese Literature	L			HU					G	
413 Introduction to Classical Chinese				HU						
414 Introduction to Classical Chinese				HU						
CHM 101 Introductory Chemistry						SQ				
107 Chemistry and Society						SQ				
113 General Chemistry						SQ				
114 General Chemistry for Engineers						SQ				
115 General Chemistry with Qualitative Analysis						SQ				
116 General Chemistry						SQ				
117 General Chemistry for Majors I						SQ				
118 General Chemistry for Majors II						SQ				
231 Elementary Organic Chemistry (if credit also earned in CHM 235)						SQ				
235 Elementary Organic Chemistry Laboratory (if credit also earned in CHM 231)						SQ				

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
348 Physical Chemistry Laboratory I (if credit also earned in CHM 349 and 452)	L									
349 Physical Chemistry Laboratory II (if credit also earned in CHM 348 and 452)	L									
452 Inorganic Chemistry Laboratory (if credit also earned in CHM 348 and 349)	L									
CIS 200 Computer Applications and Information Technology			CS							
440 Systems Design and Electronic Commerce	L									
CLS 450 Principles of Clinical Laboratory Administration (if credit also earned in CLS 460)	L									
460 Principles of Clinical Laboratory Education (if credit also earned in CLS 450)	L									
COM 100 Introduction to Human Communication					SB					
110 Elements of Interpersonal Communication					SB					
222 Argumentation	L									
225 Public Speaking	L									
230 Small Group Communication					SB					
241 Introduction to Oral Interpretation	L			HU						
250 Introduction to Organizational Communication					SB					
263 Elements of Intercultural Communication (Cross-listed as AFR 263)					SB			C	G	
308 Advanced Research Methods in Communication	L									
316 Gender and Communication					SB			C		
319 Persuasion and Social Influence					SB					
320 Communication and Consumerism					SB					
321 Rhetorical Theory and Research	L			HU						H
323 Communication Approaches to Popular Culture								C		
325 Advanced Public Speaking	L									
344 Performance of Oral Traditions				HU				C		
357 Communication Technology and Information Diffusion					SB					
371 Language, Culture, and Communication (Cross-listed as AFR 371)					SB			C	G	
400 Asian Pacific American Arts and Cultures				HU				C		
400 Asian Pacific Americans and Media				HU				C		
410 Interpersonal Communication Theory and Research					SB					
411 Communication in the Family					SB					
421 Rhetoric of Social Issues				HU						
426 Political Communication					SB					
441 Performance Studies				HU						
445 Narrative Performance				HU						
446 Interpretation of Literature Written by Women				HU				C		
450 Theory and Research in Organizational Communication					SB					
463 Intercultural Communication Theory and Research (Cross-listed as AFR 463)					SB				G	
CON 101 Construction and Culture: A Built Environment				HU					G	H
389 Construction Cost Accounting and Control			CS							
472 Development Feasibility Reports	L									
495 Construction Planning and Scheduling			CS							
496 Construction Contract Administration	L									
CSE 100 Principles of Programming with C++			CS							
180 Computer Literacy			CS							
181 Applied Problem Solving with Visual BASIC			CS							
183 Applied Problem Solving with FORTRAN			CS							
200 Concepts of Computer Science			CS							
210 Object-Oriented Design and Data Structures			CS							
423 Microcomputer System Hardware	L									
438 Systems Programming	L									
CSH 310 Chicana and Chicano Folklore				HU				C		
351 Contemporary Chicana and Chicano Art				HU				C		
363 Chicana and Chicano Literature (Cross-listed as ENG 363)	L			HU				C		
485 Chicana Writers	L			HU				C		
CSS 330 Chicana and Chicano Politics and Policy								C		
331 Policy Issues in the Chicana and Chicano Urban Settings								C		
336 Issues in Immigration and Migration								C		H
340 Chicanas and Chicanos in the U.S. Economy								C		
432 Issues in Chicana and Chicano Gender								C		
DAH 100 Dance in World Cultures				HU						

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
332 Major American Novels	L									
333 American Ethnic Literature (Cross-listed as AFH 333)	L							C		
352 Short Story				HU						
353 African American Literature: Beginnings Through the Harlem Renaissance (Cross-listed as AFH 353)	L			HU				C		
354 African American Literature: Harlem Renaissance to the Present (Cross-listed as AFH 354)	L			HU				C		
355 History of the Drama	L			HU						
356 The Bible as Literature				HU						
357 Introduction to Folklore				HU						
359 American Indian Literatures	L			HU				C		
361 Silent Film				HU						
362 Sound Film Genres				HU						
363 Chicana and Chicano Literature (Cross-listed as CSH 363)	L			HU				C		
372 Document Production	L									
400 History of Literary Criticism				HU						
413 History of the English Language				HU						
415 Medieval Literature				HU						
416 Chaucer: <i>Canterbury Tales</i>				HU						
417 Chaucer: <i>Troilus and Criseyde</i> and the Minor Works				HU						
418 Renaissance Literature	L			HU						
419 English Literature in the Early 17th Century	L			HU						
421 Shakespeare				HU						
422 Studies in Shakespeare				HU						
423 Renaissance Drama	L			HU						
424 Milton				HU						
425 Studies in English Romanticism				HU						
426 Victorian Poetry	L			HU						
427 Restoration and Early 18th Century				HU						
428 The Later 18th Century				HU						
430 Victorian Cultural Backgrounds	L			HU						
435 19th-Century American Poetry				HU						
439 Restoration and 18th-Century Drama				HU						
440 Studies in American Literature to 1815				HU						
441 20th-Century American Drama				HU						
443 American Poetry, 1900–1945				HU						
444 Studies in American Romanticism, 1830–1860				HU						
445 Studies in American Realism, 1870–1910	L			HU						
448 20th-Century British and Irish Novel				HU						
451 The Novel to Jane Austen				HU						H
452 The 19th-Century Novel				HU						
453 The American Novel to 1900				HU						
454 The American Novel, 1900–1945				HU						
457 American Poetry Since 1945				HU						
458 American Novel Since 1945	L			HU						
460 Western American Literature	L			HU						
461 Women and Literature				HU						
462 20th-Century Women Authors				HU						
463 European Drama from Ibsen to 1914				HU						
464 European Drama from 1914 to the Present				HU						
471 Literature for Adolescents				HU						
EPE 100 Introduction to Health and Wellness (Cross-listed as EXW 100/HES 100)					SB					
348 Psychological Skills for Optimal Performance					SB					
352 Psychosocial Aspects of Physical Activity					SB			C		
414 Electromyographic Kinesiology	L									
441 Physiology of Women in Sport	L									
443 Exercise Endocrinology	L									
448 Applied Sport Psychology	L									
452 Exercise Psychology					SB					

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
460 Theory of Strength Training	L									
ERS 130 Introduction to Environmental Science						SQ				
246 Environmental Conservation and Ecology									G	
350 Environmental Statistics			CS							
480 Ecosystem Management and Planning	L									
ETC 100 Languages of Technology			CS							
ETM 428 International Environmental Management									G	
EXW 100 Introduction to Health and Wellness (Cross-listed as EPE 100/HES 100)					SB					
300 Foundations of Exercise and Wellness	L				SB					
442 Physical Activity in Health and Disease	L									
FAS 330 Personal Growth in Human Relationships					SB					
331 Marriage and Family Relationships					SB					
332 Human Sexuality					SB					
361 Introduction to Family/Child Research Methods	L									
370 Family, Ethnic, and Cultural Diversity (Cross-listed as AFS 370)					SB			C		
431 Parent-Adolescent Relationships					SB					
435 Advanced Marriage and Family Relationships	L				SB					
FIN 456 International Financial Management									G	
461 Financial Cases and Modeling	L									
FLA 150 Introduction to East Asian Culture				HU					G	
323 Survey of Literature of the Soviet Era in Translation	L			HU					G	
400 Linguistics					SB					
420 Foreign Literature in Translation				HU					G	
421 Japanese Literature in Translation	L			HU					G	
FRE 201 Intermediate French I									G	
202 Intermediate French II									G	
205 Readings in French Literature									G	
207 French for International Professions II									G	
311 French Conversation									G	
312 French Composition									G	
319 Business French									G	
321 French Literature	L			HU						H
322 French Literature	L			HU						
411 Advanced Spoken French									G	
412 Advanced Written French									G	
415 French Civilization I				HU						
416 French Civilization II				HU					G	
441 French Literature of the 17th Century				HU						
442 French Literature of the 17th Century				HU						H
445 French Literature of the 18th Century	L			HU						
452 French Novel of the 19th Century				HU						
453 Theater of the 19th Century	L			HU						
461 Modern Narrative				HU						
462 Modern Poetry				HU						
471 The Literature of Francophone Africa and the Caribbean	L			HU						
GCU 102 Introduction to Human Geography					SB					
121 World Geography					SB				G	
141 Introduction to Economic Geography					SB				G	
240 Introduction to Southeast Asia (Cross-listed as ASB 240/HST 240/POS 240/REL 240)									G	
253 Introduction to Cultural and Historical Geography					SB				G	
322 Geography of U.S. and Canada					SB			C		
323 Geography of Latin America					SB				G	
325 Geography of Europe					SB				G	
326 Geography of Asia					SB				G	
327 Geography of Africa					SB				G	
328 Geography of Middle East and North Africa					SB				G	

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
471 Cartographic Design			CS							
473 Geographic Information Science II			CS							
GRA 318 History of Graphic Design				HU						
345 Design Rhetoric	L									
GRK 301 Ancient Greek Literature				HU						
302 Ancient Greek Literature				HU						
GRN 430 Multidisciplinary Approaches to Gerontology					SB					
HCR 210 Clinical Health Care Ethics				HU						
220 Health Care Organizations (Cross-listed as HSA 220)	L									
230 Culture and Health								C	G	
HEB 201 Intermediate Modern Hebrew									G	
202 Intermediate Modern Hebrew									G	
375 Contemporary Culture of Israel				HU					G	
HES 100 Introduction to Health and Wellness (Cross-listed as EPE 100/EXW 100)					SB					
HON 171 The Human Event	L			HU						H
172 The Human Event	L			HU						H
371 Freedom and Authority	L			HU						
372 French Cultural Influences	L			HU					G	
373 Heroes, Heroines, and Villains	L			HU						
374 Black and White Atlantic				HU					G	H
375 Science and the Modern Self	L			HU						
376 Law, Literature, and Life	L			HU						
493 Honors Thesis	L			HU						
HPS 322 History of Science				HU						H
323 History of Science				HU						H
325 Chinese Science and Medicine (Cross-listed as HST 385)				HU					G	H
330 History of Biology: Conflicts and Controversies (Cross-listed as BIO 316)										H
331 History of Medicine (Cross-listed as BIO 318)										H
410 Professional Values in Science (Cross-listed as BIO 416)	L									
HSA 220 Health Care Organizations (Cross-listed as HCR 220)	L									
HST 101 Global History Since 1500									G	H
102 Western Civilization					SB					H
103 Western Civilization					SB					H
104 Western Civilization					SB				G	H
105 Slavic Civilization					SB					H
106 Asian Civilizations					SB				G	H
107 Asian Civilizations					SB				G	H
108 Introduction to Japan					SB				G	H
109 The United States to 1865					SB					H
110 The United States Since 1865					SB					H
200 Historical Themes					SB					H
201 Historical Themes in Asia					SB					H
202 Historical Themes in Europe					SB					H
203 Historical Themes in Latin America					SB					H
204 Historical Themes in the United States					SB					H
210 American Social History	L									H
211 American Jewish History					SB					H
212 American Military History					SB					H
240 Introduction to Southeast Asia (Cross-listed as ASB 240/GCU 240/POS 240/REL 240)									G	
300 Historical Inquiry	L				SB					H
302 Studies in History					SB					H
303 Studies in Asian History					SB					H
304 Studies in European History					SB					H
305 Studies in Latin American History					SB					H
306 Studies in United States History					SB					H
309 Exploration and Empire	L									H
310 Film as History				HU						
313 American Cultural History to 1865					SB					H

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
314 American Cultural History Since 1865					SB					H
315 Political History of the United States					SB					H
316 20th-Century U.S. Foreign Relations					SB				G	H
318 United States Labor History					SB					H
319 U.S. Urban History to 1850					SB					H
320 U.S. Urban History Since 1850					SB					H
321 Constitutional History of the United States to 1865					SB					H
322 Constitutional History of the United States Since 1865					SB					H
325 Immigration and Ethnicity in the United States					SB			C		H
327 Women in U.S. History, 1600–1880					SB			C		H
328 Women in U.S. History, 1880–1980					SB			C		H
329 Women in 20th-Century U.S. West								C		H
330 Mexican Women in the United States: Conquests and Migrations	L				SB			C		H
331 Mexican American History to 1900					SB					H
332 Mexican American History Since 1900					SB			C		H
333 African American History to 1865 (Cross-listed as AFS 363)					SB			C		H
334 African American History Since 1865 (Cross-listed as AFS 364)					SB			C		H
337 American Indian History to 1900					SB			C		H
338 American Indian History Since 1900					SB			C		H
341 The U.S. West in the 19th Century					SB					H
342 The U.S. West in the 20th Century					SB					H
343 The American Southwest	L				SB					H
344 Arizona					SB					H
347 Ancient Greece					SB					H
348 Rome					SB					H
349 The Early Middle Ages					SB					H
350 The Later Middle Ages					SB					H
351 Renaissance Europe	L				SB					H
352 Europe's Reformations	L				SB					H
353 The Old Regime in Europe					SB					H
354 Revolutionary Europe					SB					H
355 Total War and the Crisis of Modernity					SB				G	H
356 Europe Since 1945					SB				G	H
361 Witchcraft and Heresy in Europe (Cross-listed as REL 374)	L									H
362 Sex and Society in Classical and Medieval Europe					SB					H
363 Sex and Society in Early Modern Europe					SB					H
364 Sex and Society in Modern Europe	L				SB					H
365 Women in Europe	L			HU	SB					H
366 England to 1689					SB					H
367 Modern Britain					SB					H
368 Culture and Imagination in European History				HU						H
370 Eastern Europe in Transition					SB				G	H
372 The Modern Middle East					SB				G	H
375 Colonial Latin America					SB					H
376 Modern Latin America					SB					H
377 Women in Colonial Latin America										H
378 Latin American Women: The National Period					SB				G	H
380 Cultural History of Latin America					SB					H
383 China					SB					H
384 China					SB				G	H
385 Chinese Science and Medicine (Cross-listed as HPS 325)				HU					G	H
386 Interpreting China's Classics (Cross-listed as HUM 312)	L			HU						H
387 Japan	L				SB					H
388 Japan					SB				G	H
391 Modern Southeast Asia					SB				G	H
405 Colonial American History to 1763					SB					H
407 The Early U.S. Republic, 1789–1850	L				SB					H
408 Civil War and Reconstruction	L				SB					H
409 The Emergence of the Modern United States, 1877 to 1918					SB					H

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
410					SB					H
411					SB					H
412					SB					H
414					SB					H
415	L				SB			C		H
416					SB			C		H
417					SB			C		H
423					SB					H
424					SB					H
426					SB					H
427					SB					H
428					SB				G	H
429					SB				G	H
430					SB					H
431					SB					H
432					SB				G	H
435					SB					H
436					SB				G	H
437				HU	SB					H
438				HU	SB				G	H
441					SB					H
442					SB					H
443					SB				G	H
445					SB				G	H
446					SB					H
447					SB					H
451					SB					H
452					SB				G	H
453					SB				G	H
455					SB				G	H
456					SB				G	H
460	L									H
493	L									
498	L									
HUM 110				HU						
200				HU						
260				HU					G	
301	L			HU						H
302	L			HU						H
310	L			HU						H
312	L			HU						H
340				HU						
401				HU						H
420				HU					G	H
440	L			HU				C		
450	L			HU						
460	L									
462	L			HU	SB					
465	L			HU						
498	L			HU						
IBS 300									G	
306					SB				G	
400								C	G	
493	L									
IDN 201									G	
202									G	
IED 410					SB			C		H
430				HU	SB			C		
444					SB					

General Studies Courses (continued)

		L	MA	CS	HU	SB	SQ	SG	C	G	H
	460				HU	SB			C		H
IEE	305			CS							
	374			CS							
	463			CS							
	475			CS							
	476			CS							
IND	316				HU						H
	317				HU						H
	470										
INT	223				HU						
	310				HU						H
	311				HU						H
	412				HU						
	442										
ITA	201									G	
	202									G	
	311									G	
	312									G	
	314									G	
	325				HU						
	415				HU					G	
	430				HU						
	441				HU						
	443				HU						H
	446				HU						
	449				HU					G	
ITM	440									G	
JPN	201									G	
	202									G	
	207									G	
	311									G	
	312									G	
	313									G	
	314									G	
	321				HU					G	
JRN	201										
	301										
JUS	100					SB					
	200					SB					
	302			CS							
	320					SB			C		
	321					SB			C		
	350					SB			C		
	360					SB					
	375					SB					
	385					SB					
	404										
	405					SB				G	
	415									G	
	420					SB			C		
	425					SB			C		
	430					SB			C		
	440										
	450										
	463					SB					
	465										
	469					SB			C		
	470					SB			C		
	474					SB			C		

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
401 Research Paper (if credit also earned in MIC 302)	L									
MIS 410 American Defense Policy I					SB					
412 American Defense Policy II					SB					
414 Comparative Defense Policy Analysis					SB					
416 Soviet/C.I.S. Foreign and Defense Policies					SB					
MKT 460 Strategic Marketing	L									
MUE 381 Music Therapy Research	L									
MUS 340 Survey of Music History				HU						H
347 Jazz in America (Cross-listed as AFH 347)				HU						
354 Popular Music				HU						
355 Survey of American Music				HU						H
356 Survey of the Musical Theatre				HU						
NTR 344 Nutrition Services Management	L									
348 Cultural Aspects of Food								C		
448 Community Nutrition	L									
NUR 362 Professional Development II: Nursing Research	L									
391 Registered Nurse Mobility I: Professional Development	L									
461 Professional Development III: The Art of Nursing				HU						
OPM 450 Changing Business Processes	L									
PGS 101 Introduction to Psychology					SB					
222 Human Sexual Behavior					SB					
270 Psychology of Adjustment					SB					
300 Contemporary Controversies in Global Politics					SB				G	
304 Effective Thinking	L									
306 Environmental Psychology					SB					
315 Personality Theory and Research					SB					
341 Developmental Psychology					SB					
350 Social Psychology					SB					
351 Honors Social Psychology	L				SB					
365 Community Psychology					SB					
414 History of Psychology	L				SB					
427 Psychology of Aging	L				SB					
441 Cognitive Development	L				SB					
443 Abnormal Child Psychology	L				SB					
444 Adolescent Psychology and Psychopathology	L									
445 Child Language and Drawing					SB					
446 Social Development	L									
450 Social Perception and Cognition	L									
451 Stereotyping, Prejudice, and Discrimination	L									
452 Applied Social Psychology	L									
461 Interpersonal Influence					SB					
463 Advanced Psychology of Adjustment	L									
465 Psychology of Stress and Coping	L									
466 Abnormal Psychology					SB					
467 Psychology of Magical Beliefs	L									
PHI 101 Introduction to Philosophy				HU						
103 Principles of Sound Reasoning	L			HU						
105 Introduction to Ethics				HU						
300 Philosophical Argument and Exposition	L									
301 History of Ancient Philosophy				HU						H
302 History of Modern Philosophy				HU						H
304 Existentialism				HU						
305 Ethical Theory				HU						
306 Applied Ethics				HU						
307 Philosophy of Law				HU						
308 Philosophy of Art				HU						
309 Social and Political Philosophy				HU						
310 Environmental Ethics				HU						
311 Philosophy in Literature				HU						

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
312 Theory of Knowledge				HU						
314 Philosophy of Science				HU						
315 Philosophy of Language				HU						
316 Metaphysics				HU						
317 Philosophy of Mind				HU						
318 Philosophy of Religion				HU						
319 Philosophy of Computing			CS	HU						
325 Philosophy of Social Science				HU	SB					
332 19th-Century Philosophy				HU						
335 History of Ethics				HU						
402 Empiricism				HU						
403 Contemporary Analytic Philosophy				HU						
PHS 110 Fundamentals of Physical Science						SQ				
208 Patterns in Nature (Cross-listed as STE 208)						SQ				
PHY 101 Introduction to Physics						SQ				
111 General Physics (if credit also earned in PHY 113)						SQ				
112 General Physics (if credit also earned in PHY 114)						SQ				
113 General Physics Laboratory (if credit also earned in PHY 111)						SQ				
114 General Physics Laboratory (if credit also earned in PHY 112)						SQ				
121 University Physics I: Mechanics (if credit also earned in PHY 122)						SQ				
122 University Physics Laboratory I (if credit also earned in PHY 121)						SQ				
131 University Physics II: Electricity and Magnetism (if credit also earned in PHY 132)						SQ				
132 University Physics Laboratory II (if credit also earned in PHY 131)						SQ				
150 Physics I						SQ				
151 Physics II						SQ				
252 Physics III						SQ				
420 Research Paper	L									
PLA 101 Landscape and Society				HU					G	
222 Computers in Landscape Architecture			CS							
310 History of Landscape Architecture (Cross-listed as APH 411)										H
411 Landscape Architecture Theory and Criticism	L									
420 Theory of Urban Design				HU						
485 International Field Studies in Planning and Landscape Architecture (Cross-listed as PUP 485)									G	
PLB 108 Concepts in Plant Biology						SQ				
200 Biology of Plants (if credit also earned in PLB 201)						SQ				
201 Biology of Plants Laboratory (if credit also earned in PLB 200)						SQ				
260 Plants in Cities: Introduction to Urban Horticulture							SG			
300 Comparative Plant Diversity	L						SG			
320 Environmental Science (Nonmajor) (Cross-listed as BIO 319)									G	
414 Plant Pathology	L									
430 Statistical Analyses in Environmental Science			CS							
432 Computer Applications in Biology (Cross-listed as BIO 406)			CS							
POR 201 Intermediate Portuguese									G	
313 Portuguese Composition and Conversation									G	
314 Portuguese Composition and Conversation									G	
321 Luso-Brazilian Literature				HU						
472 Luso-Brazilian Civilization				HU					G	
POS 101 Political Ideologies					SB					
110 Government and Politics					SB					
150 Comparative Government					SB				G	
160 Global Politics					SB				G	
220 Political Issues and Public Policy					SB					
230 Current Issues in National Politics	L				SB					
240 Introduction to Southeast Asia (Cross-listed as ASB 240/GCU 240/HST 240/REL 240)									G	
260 Current Issues in International Politics	L				SB				G	
270 American Legal System					SB					
300 Contemporary Controversies in Global Politics					SB				G	

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
377 Religion in Russia				HU						H
379 Religion, Nationalism, and Ethnic Conflict				HU					G	
381 Religion and Moral Issues	L			HU						
382 Religion, Magic, and Science	L			HU						
385 Contemporary Western Religious Thought	L			HU						
390 Women and Religion				HU					G	
410 Judaism in Modern Times				HU						H
415 The Jewish Mystical Tradition				HU						
420 Religion in American Life and Thought	L			HU						
426 American Preachers and Preaching: The Sermon in America	L			HU						
427 American Religious Thought				HU						H
444 Religion in Japan				HU					G	H
460 Studies in Islamic Religion				HU					G	
470 Religion in the Middle Ages				HU						H
471 Reformation and Modern Christianity				HU						H
480 Religion and Global Politics									G	
486 Modern Critics of Religion				HU						
RUS 201 Intermediate Russian										G
202 Intermediate Russian										G
211 Basic Russian Conversation										G
212 Basic Russian Conversation										G
311 Russian Composition and Conversation										G
312 Russian Composition and Conversation										G
321 Survey of Russian Literature	L			HU						H
322 Survey of Russian Literature	L			HU						
323 Survey of Literature of the Soviet Era	L			HU						G
411 Advanced Composition and Conversation I										G
412 Advanced Composition and Conversation II										G
420 Russian Poetry	L			HU						
421 Pushkin	L			HU						
423 Dostoyevsky	L			HU						
424 Tolstoy	L			HU						
425 Chekhov	L			HU						
426 Literatures of the Nationalities of the Former Soviet Union	L			HU						G
430 Russian Short Story	L			HU						
441 Survey of Russian Culture	L			HU						G H
SCA 250 Introduction to Scandinavian Culture				HU						G H
316 Scandinavian Cinema				HU						G
450 Masterpieces of Scandinavian Literature	L			HU						
SCM 455 Research and Negotiation	L									
SHS 367 Language Science					SB					
465 Speech and Language Acquisition					SB					
SOC 101 Introductory Sociology					SB					
301 Principles of Sociology					SB					
312 Sociology of Adolescence					SB					
315 Courtship and Marriage					SB					
318 Overview of Aging					SB					
321 Sociology of Work					SB					
331 Environmental Sociology					SB					G
332 Urban Sociology					SB					G
333 Population					SB					G
340 The Sociology of Deviance					SB					
341 Modern Social Problems					SB					
352 Social Change					SB					G H
360 Sociological Psychology					SB					
361 Variant Sexuality					SB					
363 Men and Masculinity					SB					
365 The Sociology of Mass Communication					SB					
390 Social Statistics I			CS							

General Studies Courses (continued)

	L	MA	CS	HU	SB	SQ	SG	C	G	H
391 Sociological Research					SB					
415 The Family					SB					
416 Marriage Problems in Contemporary Society	L				SB					
417 Family Violence					SB					
418 Aging and the Life Course					SB					
420 Sociology of Religion	L				SB					
421 Education and Society					SB					
422 Sociology of Complex Organizations	L				SB					
423 Social Class and Stratification	L				SB					
424 Women and Health	L				SB					
427 Sociology of Health and Illness	L				SB					
429 Sociology of Law					SB					
433 Demographic Methods					SB					
446 Sociology of Crime					SB					
451 Comparative Sociology					SB				G	
455 Social Movements					SB					
456 Political Sociology					SB				G	
464 Women's Roles	L				SB			C		
470 Racial and Ethnic Relations					SB			C		
474 African-Americans in Modern Society	L				SB			C		
483 History of Social Thought	L				SB					
485 Sociology of Knowledge	L				SB					
486 Contemporary Theory					SB					
SPA 201 Intermediate Spanish									G	
202 Intermediate Spanish									G	
203 Intermediate Spanish for Bilinguals									G	
204 Intermediate Spanish for Bilinguals									G	
207 Spanish for International Professions II									G	
313 Spanish Conversation and Composition									G	
314 Spanish Conversation and Composition									G	
319 Business Correspondence and Communication									G	
325 Introduction to Hispanic Literature				HU						
412 Advanced Conversation and Composition									G	
413 Advanced Spanish Grammar									G	
420 Applied Spanish Linguistics	L									
421 Spanish in the Southwest	L				SB			C		
425 Spanish Literature				HU						
426 Spanish Literature				HU						
427 Spanish American Literature	L									
428 Spanish American Literature	L								G	
464 Mexican American Literature				HU						
471 Civilization of the Spanish Southwest				HU						
472 Spanish American Civilization				HU					G	H
473 Spanish Civilization				HU	SB				G	
485 Mexican American Short Story	L									
SPE 311 Orientation to Education of Exceptional Children					SB					
SPF 111 Exploration of Education					SB					
301 Culture and Schooling	L									
STE 208 Patterns in Nature (Cross-listed as PHS 208)						SQ				
STP 220 Conceptual Statistics			CS							
226 Elements of Statistics			CS							
326 Intermediate Probability			CS							
420 Introductory Applied Statistics			CS							
429 Experimental Statistics			CS							
SWU 271 Introduction to Social Work					SB					H
301 Human Behavior in the Social Environment I	L				SB					
321 Statistics for Social Workers			CS							
340 Human Behavior in the Social Environment II					SB					
374 Diversity and Oppression in a Social Work Context								C		

Minors, Certificates, and Interdisciplinary Studies

Interdisciplinary studies are available to students through an interdisciplinary degree, such as the Bachelor of Interdisciplinary Studies, or an extensive choice of minors or certificates that may be taken in conjunction with other majors. Since interdisciplinary studies provide skills that support employment in a rapidly changing workplace, students are encouraged to consider these options. Consult the academic advisor in your major about the impact of enrolling in a minor or certificate program.

MINORS

A minor is an approved, coherent concentration of academic study in a single discipline, involving substantially fewer hours of credit than a corresponding major. Most ASU colleges offer undergraduate minors in addition to majors; see the “ASU Minors” table, page 104.

Students in most majors may pursue one or more minors and, upon successful completion of the prescribed course work, have that accomplishment officially recognized on the ASU transcript at graduation if (1) the college/department of the minor officially certifies, through established verification procedures, that all requirements for the minor have been met and (2) the college (and, in certain colleges, the department) of the student’s major allows the official recognition of the minor.

A student wishing to pursue a specific minor should consult an academic advisor in the unit offering that minor to ensure that an appropriate set of courses is taken.

Note: Certain major and minor combinations may be deemed inappropriate either by the college or department of the major or minor. Inappropriate combinations include (but would not be limited to) ones in which an excessive number of courses in the minor are simultaneously being used to fulfill requirements of the student’s major.

CERTIFICATES

Students may pursue some certificate programs along with a major and other certificate programs independently. Graduate certificates and postbaccalaureate certificates are available to students who already hold a bachelor’s degree. For more information, see the “ASU Undergraduate Certificates” table, page 105; “ASU Postbaccalaureate Certificates” table, page 106; and “ASU Graduate Certificates” table, page 106. Graduate certificates constitute graduate work; postbaccalaureate certificates are distinct from graduate certificates and are an extension of the undergraduate curriculum.

CONCURRENT AND DUAL DEGREES

Graduate students have the opportunity to pursue more than one degree at the same time as part of an organized program. For more information, see the “Concurrent and Dual Degrees” table, page 517, and the *Graduate Catalog*.

INTERDISCIPLINARY STUDIES

Bachelor of Interdisciplinary Studies. For information about the Bachelor of Interdisciplinary Studies at ASU Main or ASU East, see “Bachelor of Interdisciplinary Studies,” page 108, or “Interdisciplinary Studies—B.I.S.,” page 620.

Energy Studies. An expanding instructional and research involvement in energy matters exists through the following three curricular paths:

1. general studies, which emphasize energy as an elective beyond the scope of a chosen major (for more information, call 480/965-4548);
2. specific studies in the College of Architecture and Environmental Design, for those pursuing the Master of Architecture degree and the Master of Science degree in Building Design; and
3. specific studies in the College of Engineering and Applied Sciences, usually for those seeking a degree in a branch of engineering.

Environmental Studies. The Center for Environmental Studies encourages and coordinates interdisciplinary environment-related activities in the natural and social sciences within the university. The center sponsors special courses, conferences, and workshops on environmental topics. Drawing from faculty and students throughout the university, the center participates in research and community programs relating to environmental problem areas. It does not formally offer courses or a degree program. For more information, see “Center for Environmental Studies,” page 35.

Film Studies. The Film Studies Program exists not only to provide information and experience but also to serve as a means of creative expression for the student and as a useful subject and tool in teaching. The program is not designed to produce professional filmmakers, but it may provide practical preparation for students desiring further film study in other institutions.

Inquiries about this program should be directed to the Film Studies coordinator, at 480/965-7644.

Gerontology. The Gerontology Program brings together faculty from several disciplines to teach courses related to adult development and aging, to collaborate on gerontological research, and to participate in projects of service to older adults.

A certificate at the postbaccalaureate level and an undergraduate minor are available in Gerontology. The certificate consists of 24 semester hours—12 hours of required course work and 12 hours of electives. The minor consists of 18 semester hours—six hours of required course work and 12 hours of electives. Courses related to aging are taught throughout the university by faculty who are active contributors to research, theory, and public policy and practice. In

addition, gerontology provides students with opportunities to gain practical experience in working with elderly people. A practicum, held at the Veterans Administration Hospital, is available to students who have completed some gerontology course work. Gerontology also helps students find rewarding internships in community programs for older adults. For more information, see “Gerontology Certificate Program,” page 687, and “Gerontology,” page 500, or refer to the current *Student Handbook in Gerontology*.

Islamic Studies. The art, history, geography, and religion of the Islamic world are the subjects of several courses offered by departments in the Herberger College of Fine Arts and the College of Liberal Arts and Sciences. For information, call the Department of Religious Studies at 480/965-7145.

Linguistics. Linguistics concentrations are offered in master’s degree programs in the Departments of Anthropology, English, and Languages and Literatures through the Graduate College. Numerous linguistics courses are offered in these and other departments. For information, call the University Committee on Linguistics at 480/965-3168.

MILITARY OFFICER TRAINING

U.S. Air Force and U.S. Army ROTC units are active on the ASU campus. See “Department of Aerospace Studies,” page 328, and “Department of Military Science,” page 413, for more information.

Defense Activity for Nontraditional Education Support (DANTES). ASU is a participating institution with DANTES and is listed in the DANTES Directory of Independent Study. DANTES is an executive agency of the Department of Defense that provides educational support for the voluntary education programs of all services. The primary missions of DANTES are (1) to provide nationally recognized examination and certification programs as part of the voluntary education programs of military services and (2) to facilitate the availability of high-quality independent institutions for service men and women.

WESTERN INTERSTATE COMMISSION FOR HIGHER EDUCATION (WICHE)

For Arizona residents who wish to attend professional schools of dentistry, occupational therapy, optometry, osteopathy, and veterinary medicine in one of the other western states, Arizona has joined with other western states to create the Western Interstate Commission for Higher Education. Through WICHE, qualified Arizona residents may attend schools in other western states at essentially the same expense to the students as to residents of the state in which the school is located. Students must have maintained at least average grades in their preprofessional work and must have been legal residents of Arizona for at least the last five years. Recipients are required to return to Arizona to practice or to repay a portion of the funds expended in their behalf.

For applications and more information, call 602/229-2500.



The Sun Devil Marching Band's flag line proudly wields the Sparky flag during the homecoming parade.

Tim Trumble photo

ASU Minors

Minor	Administered By	Campus	Page
African American Studies	African American Studies Program	Main	331
American Indian Studies	American Indian Studies Program	Main	471
American Studies	Department of American Studies	West	671
Anthropology	Department of Anthropology	Main	334
Art History	School of Art	Main	271
Asian Languages (Chinese/Japanese)	Department of Languages and Literatures	Main	386
Astronomy	Department of Physics and Astronomy	Main	421
Biology	Department of Biology	Main	341
Business*	College of Business	Main	150
Chemistry	Department of Chemistry and Biochemistry	Main	347
Chicana and Chicano Studies	Department of Chicana and Chicano Studies	Main	351
Communication	Hugh Downs School of Human Communication	Main	474
Communication Studies	Department of Communication Studies	West	671
Dance	Department of Dance	Main	287
Economics for Students Planning a Career in Law	Department of Economics	Main	353
English	Department of American Studies	West	671
English with a Concentration in Linguistics	Department of English	Main	354
English with a Concentration in Literature	Department of English	Main	354
Environmental Resources	Morrison School of Agribusiness and Resource Management	East	613
Ethnic Studies	Ethnic Studies Program	West	671
Exercise and Wellness	Department of Exercise and Wellness	East	626
Exercise Science/Physical Education	Department of Exercise Science and Physical Education	Main	361
Family and Human Development	Department of Family and Human Development	Main	364
Film and Video Studies	Department of Interdisciplinary Arts and Performance	West	671
Food and Nutrition Management	Department of Nutrition	East	631
French	Department of Languages and Literatures	Main	387
General Economics	Department of Economics	Main	353
Geography	Department of Geography	Main	368
Geological Sciences	Department of Geological Sciences	Main	372
German	Department of Languages and Literatures	Main	387
Gerontology	Gerontology Program	Main	102
		West	671
History	Department of History	Main	376
	Department of American Studies	West	671
Human Nutrition	Department of Nutrition	East	631
Humanities	Interdisciplinary Humanities Program	Main	382
Interdisciplinary Arts and Performance	Department of Interdisciplinary Arts and Performance	West	671
Interior Design History	School of Design	Main	136
Italian	Department of Languages and Literatures	Main	387
Justice Studies	School of Justice Studies	Main	482
Landscape Studies	School of Planning and Landscape Architecture	Main	140
Life Sciences	Department of Life Sciences	West	671
Mass Communication	Walter Cronkite School of Journalism and Telecommunication	Main	479
Mathematics	Department of Integrative Studies	West	671
	Department of Mathematics	Main	404
Microbiology	Department of Microbiology	Main	410
Music	School of Music	Main	297
Philosophy	Department of Philosophy	Main	417
	Department of Integrative Studies	West	671
Physics	Department of Physics and Astronomy	Main	421
Plant Biology	Department of Plant Biology	Main	428
Political Science	Department of Political Science	Main	432

* This minor is for nonbusiness majors only.

ASU Minors (continued)

Minor	Administered By	Campus	Page
Politics	Department of Social and Behavioral Sciences	West	671
Prelaw	College of Human Services	West	671
Psychology	Department of Psychology	Main	438
	Department of Social and Behavioral Sciences	West	671
Recreation Management	Department of Recreation Management and Tourism	Main	489
Religious Studies	Department of Religious Studies	Main	442
	College of Arts and Sciences	West	671
Russian	Department of Languages and Literatures	Main	387
Small Business*	College of Business	Main	174
Social and Behavioral Sciences	Department of Social and Behavioral Sciences	West	671
Sociocultural Anthropology	Department of Social and Behavioral Sciences	West	671
Sociology	Department of Sociology	Main	446
	Department of Social and Behavioral Sciences	West	671
Spanish	Department of American Studies	West	671
	Department of Languages and Literatures	Main	387
Special Events Management	Department of Recreation and Tourism Management	West	671
Speech and Hearing Science	Department of Speech and Hearing Science	Main	449
Theatre	Department of Theatre	Main	307
Tourism	Department of Recreation Management and Tourism	Main	489
Tourism Management	Department of Recreation and Tourism Management	West	671
Urban Planning	School of Planning and Landscape Architecture	Main	140
Women's Studies	Women's Studies Program	Main	453
		West	671

* This minor is for nonbusiness majors only.

ASU Undergraduate Certificates

Certificate	Administered By	Campus	Page
Advanced Business English Certificate*	College of Extended Education	Extended	688
African American Studies Certificate	African American Studies Program	Main	331
American Indian Studies Certificate	American Indian Studies Program	Main	470
American Public Policy Certificate	Department of Political Science	Main	431
Asian Pacific American Studies Certificate	Asian Pacific American Program	Main	472
Asian Studies Certificate	Center for Asian Studies	Main	376
Business English Certificate*	College of Extended Education	Extended	688
Civic Education Certificate	Department of Political Science	Main	432
East Asian Studies Certificate	Center for Asian Studies	Main	387
English as a Second Language Certificate*	College of Extended Education	Extended	688
Enriched College Degree Certificate	College of Liberal Arts and Sciences	Main	324
Ethics Certificate	Department of Philosophy	Main	417
Ethnic Studies Certificate	College of Arts and Sciences	West	672
Film and Video Studies Certificate	College of Arts and Sciences	West	672
Hazardous Materials and Waste Management Certificate	Department of Information and Management Technology	East	649
Health Physics Certificate	Pre-Health Professions Office	Main	325
History and Philosophy of Science Certificate	Department of Philosophy	Main	417
Human Performance Improvement Certificate*	College of Extended Education and the American Society of Training and Development	Extended	687
International Business Studies Certificate	College of Business	Main	166
International Studies Certificate	Department of Political Science	Main	432
Jewish Studies Certificate	Jewish Studies Committee	Main	326
Latin American Studies Certificate	Latin American Studies Center	Main	326
Medieval and Renaissance Studies Certificate	Arizona Center for Medieval and Renaissance Studies (ACMRS)	Main	326
Multimedia Writing and Technical Communication Certificate	East College	East	628

* This certificate is not for academic credit.

ASU Undergraduate Certificates (continued)

Certificate	Administered By	Campus	Page
Nonprofit Management Certificate*	College of Extended Education and the United Way	Extended	687
Nonprofit/Youth Agency Administration: American Humanics Certificate	Department of Recreation Management and Tourism	Main	489
Public Administration and Public Management Certificate	School of Public Affairs	Main	486
Quality Analysis Certificate	College of Business	Main	154
Russian and East European Studies Certificate	Russian and East European Studies Consortium	Main	326
Scandinavian Studies Certificate	Department of Languages and Literatures	Main	326
Small Business and Entrepreneurship Certificate	College of Business	Main	175
Southeast Asian Studies Certificate	Program for Southeast Asian Studies	Main	327
Translation Certificate	Department of Languages and Literatures	Main	387
Women's Studies Certificate	Women's Studies Program	West	672
		Main	327
Writing Certificate	Department of American Studies	West	672
	Department of English	Main	355

* This certificate is not for academic credit.

ASU Postbaccalaureate Certificates

Certificate	Administered By	Campus	Page
Accountancy, Postbaccalaureate Certificate in	School of Management	West	—
Communication and Human Relations, Postbaccalaureate Certificate in	College of Human Services	West	—
Gerontology Certificate	College of Human Services	West	672
Multimedia Writing and Technical Communication, Postbaccalaureate Certificate in	East College	East	628
Post-Bachelor's Artist Diploma	School of Music	Main	—
Professional Accountancy, Postbaccalaureate Certificate in	School of Management	West	672

ASU Graduate Certificates

Certificate	Administered By	Campus	Page
Geographic Information Science, Interdisciplinary Certificate in	College of Liberal Arts and Sciences	Main	—
Gerontology Certificate	Graduate College	Main	500
		Extended	687
Indian Law Certificate	College of Law	Main	313
Medieval Studies Certificate	Arizona Center for Medieval and Renaissance Studies (ACMRS)	Main	376
Museum Studies Certificate	Department of Anthropology	Main	—
Nonprofit Leadership and Management Certificate	Center for Nonprofit Leadership and Management	Main	470
Post-Master's Nurse Practitioner Certificate	College of Nursing	Main	—
Renaissance Studies Certificate	ACMRS	Main	—
Scholarly Publishing Certificate	Department of History	Main	—
Statistics	Committee on Statistics	Main	—
Translation Certificate	Department of Languages and Literatures	Main	387
Transportation Systems Certificate	Committee on Transportation Systems	Main	501

Division of Undergraduate Academic Services

William S. Johnson, Ph.D., Executive Director

www.asu.edu/duas

The Division of Undergraduate Academic Services is a primary source of academic support for students, faculty, and staff. The division coordinates and offers academic programs and services designed to enhance the academic experience of ASU undergraduate students. The goals of the division are to play a major role in student retention, provide students the support necessary for successful completion of their first year and beyond, and offer students learning experiences that complement those provided by other academic units.

The division includes Education Support Services, Bachelor of Interdisciplinary Studies, Advising Services, and General Studies.

EDUCATION SUPPORT SERVICES

This unit provides university-wide teaching and learning support to students and faculty in defined academic areas.

For more information, call 480/965-3097.

Campus Match

Campus Match is a first-semester fall program that gives freshmen the opportunity to attend classes in small learning communities according to their academic interest. Students choose a “cluster” of classes from a wide variety of offerings. Each cluster is limited to 25 students who enroll in and attend classes together. All students attend a weekly peer-led seminar that facilitates their social and academic adjustment to the university.

Academic Success at the University Courses

The purpose of the UNI courses is to assist first-year, transfer, and reentry students in making a successful transition to the university. Students learn university resources, policies and procedures, study skills, values and goal setting, human diversity, academic and career planning, and other skills.

ACADEMIC SUCCESS AT THE UNIVERSITY (UNI)

UNI 100 Academic Success at the University. (3)

fall, spring, summer

Orientation to campus resources, study skills, and other academic and social issues for college students. Introduction to an understanding of human diversity, values, and perspectives as they relate to student success. Lecture, seminar, discussion. Prerequisite: freshman or sophomore or transfer student.

UNI 101 Student Success Seminar. (1)

fall, spring, summer

Understanding human diversity, perspectives, and values as they relate to student success. Orientation to ASU resources, study skills, and academic and social issues for students. Seminar, discussion.

UNI 494 Special Topics. (1–4)

fall and spring

Possible topics:

(a) Science is Magic Internship. (3)

Presents science demonstrations to K–8 children at their schools. Interns are trained by personnel from the Center of Solid-State Science. This internship does not follow the format of the others.

Supplemental Instruction

Supplemental Instruction (SI) works to improve student performance and increase retention in historically difficult courses (those with high rates of “D,” “E,” and “W” grades). An SI leader attends class and offers voluntary study sessions to all students enrolled in the class. During the study sessions, students work together to learn course content and to enhance study skills.

Summer Bridge

Summer Bridge is a program designed to assist first-semester freshmen in making the transition from high school to university life. Summer Bridge is a five-week, residential program that provides a full academic curriculum in conjunction with a rich residence hall experience. The program assists participants in acclimating to campus, accessing student support programs and services, and enhancing classroom skills.

Service Learning Program

The Service Learning Program uses community service to enhance education. The program is based on the concept of reciprocal learning. Service Learning sections of regular courses are linked to credit-bearing internships where students apply what they are learning in the community to their course work.

For example, some Service Learning students contribute one-on-one homework tutoring, reading development, educational enrichment workshops, and learning readiness programs for children and youth for six hours a week during the semester. In turn, the tutors’ community experiences and research form the basis of their classroom papers and research. Other Service Learning students lead elementary and middle-school students in hands-on learning activities based on the content of the linked ASU courses.

Students may enroll in the internships with previous or current enrollment in one of the following linked courses or equivalent, approved courses.

See appropriate course listings for more details.

Linked Courses

EED 420 Science Methods, Management, and Assessment in the Elementary School.....	3
ENG 102 First-Year Composition.....	3
ENG 217 Writing Reflective Essays L.....	3
ENG 312 English in Its Social Setting <i>HU/SB</i>	3

ENG 471 Literature for Adolescents <i>HU</i>	3
SOC 332 Urban Sociology <i>SB, G</i>	3
SOC 341 Modern Social Problems <i>SB</i>	3

Sciences and Additional Courses

GLG 101 Introduction to Geology I (Physical) <i>SQ, G</i>	3
GLG 103 Introduction to Geology I—Laboratory <i>SQ</i>	1
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
MTE 180 Theory of Elementary Mathematics.....	3
PHS 208 Patterns in Nature <i>SQ</i>	4
PLB 108 Concepts in Plant Biology <i>SQ</i>	4

Service Learning Internships

ENG 484 Writing Internship.....	3
GLG 484 Geology Internship.....	3
GPH 484 Geography Internship.....	3
MTE 484 Theory of Elementary Mathematics Internship.....	3
PHS 484 Physical Science Internship.....	3
PLB 498 PS: Plant Biology Internship.....	3
SOC 484 Internship.....	3
UNI 494 ST: Science is Magic Internship.....	3

Writing Across the Curriculum (WAC)

Curriculum Development and Support. WAC Curriculum Development and Support is designed to assist in enhancing the quality of writing and critical thinking skills of university students.

WAC specialists consult with faculty on methods of developing and integrating writing assignments into course content. The specialists also provide customized in-class writing workshops designed to assist students in researching and responding to writing assignments.

Writing Center. The Writing Center provides students with one-on-one and group tutoring in writing skills. Rather than proofreading or editing students' writing, the Writing Center teaches students the skills they need to improve their writing processes and products.

BACHELOR OF INTERDISCIPLINARY STUDIES

The Bachelor of Interdisciplinary Studies (B.I.S.) is a university-wide program intended for the student who has academic interests that might not be satisfied with existing majors. Building on two academic concentrations and an interdisciplinary core, students in the B.I.S. are expected to take an active role in creating their educational plan and defining their vocational goals. The B.I.S. emphasizes written communication, versatility, and critical thinking—skills desired in a changing workplace environment. Self-assessment and appraisal of opportunities to support academic and career goals are key elements in the core courses. For information about the B.I.S. at ASU East, see “Interdisciplinary Studies—B.I.S.,” page 620.

At ASU Main, students, other than entering freshmen, must attend an informational session conducted by an academic advisor before declaring the B.I.S. major. For more information, visit Cross-College Advising Services (CAS) in UASB 129 or call 480/965-4464.

The combination of areas of concentration gives students flexibility in creating a unique program to accomplish individualized academic goals. These combinations illustrate a range of examples:

1. anthropology and religious studies;
2. communication and small business;

3. communication and sociology;
4. dance and exercise science/physical education;
5. economics and Spanish;
6. environmental resources and geology;
7. environmental resources and political science;
8. justice studies and political science;
9. nonprofit/youth agency development and theatre; and
10. psychology and women's studies.

Basic Requirements

The B.I.S. requires 120 semester hours. The major is composed of a 12-semester-hour core and a minimum of 36 semester hours in two concentrations (18 hours each). Throughout the core sequence, the student assembles a portfolio including self-assessment of progress toward career goals and an evaluation of key educational and personal activities that may apply. All core courses must be completed with a grade of “C” or higher.

Core Courses

BIS 301 Foundations of Interdisciplinary Studies <i>L</i>	3
BIS 302 Interdisciplinary Principles.....	3
BIS 401 Applied Interdisciplinary Studies.....	3
BIS 402 Senior Seminar <i>L</i>	3
Total.....	12

Other Requirements

In addition to the basic requirements, students must complete all university requirements, including First-Year Composition and General Studies. Early advising is recommended to facilitate selecting courses that may apply to both the General Studies requirements and the areas of concentration.

Declaring the B.I.S. Major. Academic advising from CAS is required before being approved to declare the B.I.S. In addition, the following requirements must be met:

1. 45 semester hours of college credit;
2. cumulative G.P.A. of 2.00; and
3. selection of two concentrations, with a minimum of two courses in each (minimum grade of “C”) completed or one completed and one in progress (i.e., after the drop/add period) in each area.

All incoming students and continuing students with a minimum GPA of 2.00 who do not meet the above requirements are placed in a pre-B.I.S. major until the requirements have been met.

Approved Concentrations

Each concentration requires 18 semester hours, with a grade of “C” or higher. Twelve of these hours must be in upper-division courses. The concentrations—shown in the “B.I.S. Concentrations” table, page 109—are mostly based on existing minors or certificate programs and should represent academic interests that the student wishes to integrate into a meaningful program. Concentrations based on minors or certificates with fewer than 18 hours have additional semester hours required. Complete information on each concentration is available by visiting CAS in UASB 129 or by accessing the B.I.S. Web site at www.asu.edu/duas/bis.

B.I.S. Concentrations

Concentration	College	Campus	Page
African American studies	College of Liberal Arts and Sciences	Main	330
American Indian studies	College of Public Programs	Main	471
Anthropology	College of Liberal Arts and Sciences	Main	333
Art history	Herberger College of Fine Arts	Main	270
Asian Pacific American studies	College of Public Programs	Main	472
Asian studies	College of Liberal Arts and Sciences	Main	376
Astronomy	College of Liberal Arts and Sciences	Main	420
Biology ¹	College of Liberal Arts and Sciences	Main	341
Business	College of Business	Main	174
Chemistry	College of Liberal Arts and Sciences	Main	347
Chicana and Chicano studies	College of Liberal Arts and Sciences	Main	351
Chinese	College of Liberal Arts and Sciences	Main	388
Communication	College of Public Programs	Main	473
Dance	Herberger College of Fine Arts	Main	285
East Asian studies	College of Liberal Arts and Sciences	Main	442
Economics	College of Liberal Arts and Sciences	Main	353
Economics for students planning a career in law	College of Liberal Arts and Sciences	Main	353
Education	College of Education	Main	182
English with a concentration in linguistics ²	College of Liberal Arts and Sciences	Main	355
English with a concentration in literature ²	College of Liberal Arts and Sciences	Main	355
English—writing certificate ²	College of Liberal Arts and Sciences	Main	355
Environmental geography ³	College of Liberal Arts and Sciences	Main	367
Environmental resources	Morrison School of Agribusiness and Resource Management	East	612
Environmental science ⁴	—	East	613
Exercise science/physical education	College of Liberal Arts and Sciences	Main	625
Family studies/child development	College of Liberal Arts and Sciences	Main	364
Food and nutrition management	East College	East	629
French	College of Liberal Arts and Sciences	Main	387
Geographical information science ³	College of Liberal Arts and Sciences	Main	372
Geography ³	College of Liberal Arts and Sciences	Main	366
Geography for business ³	College of Liberal Arts and Sciences	Main	372
Geological sciences	College of Liberal Arts and Sciences	Main	372
German	College of Liberal Arts and Sciences	Main	385
Gerontology	Graduate College	Main	500
Global family ⁴	—	East	—
Hazardous materials and waste management	College of Technology and Applied Sciences	East	649
History	College of Liberal Arts and Sciences	Main	376
History and philosophy of science	College of Liberal Arts and Sciences	Main	376
Human nutrition	East College	East	631
Humanities	College of Liberal Arts and Sciences	Main	382
Interior design history	College of Architecture and Environmental Design	Main	134
International business studies ⁴	College of Business	Main	154
International geography ³	College of Liberal Arts and Sciences	Main	366
Italian	College of Liberal Arts and Sciences	Main	386
Japanese	College of Liberal Arts and Sciences	Main	388
Jewish studies	College of Liberal Arts and Sciences	Main	376
Justice studies	College of Public Programs	Main	482
Latin American studies	College of Liberal Arts and Sciences	Main	353
Mass communication	College of Public Programs	Main	479
Mathematics	College of Liberal Arts and Sciences	Main	404
Medieval and Renaissance studies	College of Liberal Arts and Sciences	Main	376
Microbiology ¹	College of Liberal Arts and Sciences	Main	410

¹ Students may not use more than one concentration in the life sciences: biology, microbiology, and plant biology.

² Students may not use more than one English concentration.

³ Students may not use more than one geography concentration.

⁴ The program may award a certificate upon completion.

B.I.S. Concentrations (continued)

Concentration	College	Campus	Page
Multimedia writing and technical communication	East College	East	628
Music	Herberger College of Fine Arts	Main	290
Nonprofit/youth agency development	College of Public Programs	Main	489
Organizational studies	—	—	—
Philosophy	College of Liberal Arts and Sciences	Main	417
Physics	College of Liberal Arts and Sciences	Main	421
Plant biology ¹	College of Liberal Arts and Sciences	Main	428
Political science	College of Liberal Arts and Sciences	Main	431
Psychology	College of Liberal Arts and Sciences	Main	438
Public administration	College of Public Programs	Main	486
Quality analysis	College of Business	Main	154
Recreation management	College of Public Programs	Main	488
Religious studies	College of Liberal Arts and Sciences	Main	442
Russian	College of Liberal Arts and Sciences	Main	387
Russian and East European studies	College of Liberal Arts and Sciences	Main	387
Scandinavian studies	College of Liberal Arts and Sciences	Main	387
Small business	College of Business	Main	174
Sociology	College of Liberal Arts and Sciences	Main	446
Southeast Asian studies—area studies option	College of Liberal Arts and Sciences	Main	376
Southeast Asian studies—language option	College of Liberal Arts and Sciences	Main	387
Spanish	College of Liberal Arts and Sciences	Main	387
Spanish for native speakers	College of Liberal Arts and Sciences	Main	387
Theatre	Herberger College of Fine Arts	Main	305
Tourism	College of Public Programs	Main	489
Urban planning	College of Architecture and Environmental Design	Main	140
Women's studies	College of Liberal Arts and Sciences	Main	454

¹ Students may not use more than one concentration in the life sciences: biology, microbiology, and plant biology.

² Students may not use more than one English concentration.

³ Students may not use more than one geography concentration.

⁴ The program may award a certificate upon completion.



Alumni and students cheer for their team at Sun Devil Stadium during the homecoming game of 2000.

Tim Trumble photo

A minimum of three semesters is required to complete the core sequence. BIS 301 is taken first and is the prerequisite to BIS 302. BIS 301 and 302 are prerequisites to 401 and 402, which may be taken concurrently; however, BIS 401 is a corequisite or prerequisite for 402. To enroll in BIS 401, a student must apply for the course during the semester before desired enrollment.

BACHELOR OF INTERDISCIPLINARY STUDIES (BIS)

BIS 301 Foundations of Interdisciplinary Studies. (3)

fall and spring

Introduces concepts and methods of interdisciplinary study by critically examining anticipated 21st-century workplace and civic trends. Lecture, seminar, discussion. Prerequisites: B.I.S. major; 2.00 GPA. *General Studies: L*

BIS 302 Interdisciplinary Principles. (3)

fall and spring

Explores interdisciplinarity and integration as applied to various approaches of human inquiry. Lecture, seminar, discussion. Prerequisite: BIS 301.

BIS 401 Applied Interdisciplinary Studies. (3)

fall and spring

Applies interdisciplinary problem-solving skills in internships, service-learning, or research; may involve individual or group projects combining both concentrations. Prerequisites: BIS 301, 302; prior application.

BIS 402 Senior Seminar. (3)

fall and spring

Capstone course helps students integrate their classroom and experiential learning. Students choose among course topics that address their interests. Lecture, seminar, discussion. Prerequisites: BIS 301, 302. Pre- or corequisite: BIS 401. *General Studies: L*

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for

working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The ASU Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see "ASU Extended Campus," page 683, or access the Web site at www.asu.edu/xed.

ADVISING SERVICES

Cross-College Advising Services

Cross-College Advising Services (CAS) is a central advising, referral, and information facility whose staff is available to assist students in their academic careers at ASU. Emphasis is placed on advising services to first-time, prospective, and transfer students and students in transition, such as those changing majors and those without majors. In addition to guidance in the exploration or selection of a major, CAS provides general academic information and referrals to all areas of student academic support.

CAS is located in UASB 129 and can be reached by phone at 480/965-4464.

Degree Audit Reporting System (DARS)

DARS is an online tool that provides students with consistent, accurate information regarding their academic requirements. Through this system, a degree audit is produced that matches a student's completed courses against degree program requirements in a matter of seconds. The audit allows students to assess their progress toward their degree or to determine how their earned credits would apply if they were to pursue another degree program. Audits may be obtained from the student's academic advisor.

GENERAL STUDIES

All students enrolled in a baccalaureate degree program must satisfy the General Studies requirement. For more information, see "University Graduation Requirements," page 74, and "General Studies," page 78.

The Craig and Barbara Barrett Honors College

Ted Humphrey, Ph.D., Dean

www.asu.edu/honors



Kimberly Jones (left) of the College of Business Honors Program helps Stephanie Cohen develop her program of study.

Doug Crouch photo

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MISSION

The Craig and Barbara Barrett Honors College is a community of learners dedicated to superior undergraduate education based on the pursuit of excellence, respect for the individual, commitment to integrity, and service to society.

The college offers talented, motivated students educational opportunities designed to enrich and further their personal academic and career goals. It is a portal through which academically talented students gain unique access to the university's human and physical resources. Transdisciplinary in nature, the college develops curricular and other learning opportunities to meet general and disciplinary undergraduate educational objectives. The college supports undergraduate research, encourages study abroad, guides students to relevant internships, mentors applicants for fellowships and scholarships, and assists students with application to graduate school.

The Barrett Honors College serves students seeking degrees at ASU Main, in Tempe; ASU West, in northwest Phoenix; and ASU East (Williams Campus) in southeast Mesa. Students across the university can take advantage of the university's full resources with the assurance of consistently distinguished teaching and research and with commensurately rigorous expectations for performance.

Students from all disciplinary colleges and academic majors enroll in the Barrett Honors College. The Colleges of Business, Engineering and Applied Sciences, Liberal Arts and Sciences, Public Programs, and Nursing offer particularly strong programs. The College of Architecture and Environmental Design and the School of Social Work developed the nation's first honors curricula in their disciplines. Students with majors in the College of Education and the Herberger College of Fine Arts can also choose from a wide range of exciting courses, especially at the lower division.

CURRICULUM

Students seeking to graduate from the Barrett Honors College must also graduate from a disciplinary college. The ASU honors curriculum normally allows students to finish all requirements within the 120 semester hours of credit usually required for graduation.

SPECIAL PROGRAMS

Office of National Scholarship Advisement

The Office of National Scholarship Advisement assists honors and other high-achieving students by identifying nationally competitive programs appropriate to each person's intellectual and career goals, nurturing these prospective applicants, and advancing their candidacy. This office, administered by the college, serves the entire ASU commu-

nity. ASU students regularly earn distinction in the most rigorous and prestigious scholarship competitions. Many pursue enhanced degree programs and research projects under the auspices of Goldwater or Truman Scholarships. Other students undertake postgraduate study in the United States and abroad as Rhodes, Marshall, Fulbright, Udall, National Science Foundation, or Mellon Scholars. Many others have been recognized by a range of postgraduate awards, fellowships, and assistantships. *This office does not administer any need- or merit-based student financial assistance.* For more information, call 480/965-5894.

Study Abroad

Students participating in the Barrett Honors College have exclusive access to three summer study abroad programs—one in Britain, one in Paris, and one that travels to Athens, Rome, and Tunis—and to the ASU International Programs office, which offers more flexible course registration and transfer arrangements. These plans allow students to earn honors credit while overseas.

Internships/Mentorships

Students in the Barrett Honors College may participate in special internship opportunities or mentoring by leaders—in government, industry, and the private sector—throughout metropolitan Phoenix. For more information, call 480/965-2359.

Events/Programming

Students enrolled in the Barrett Honors College participate in a range of cultural enrichment activities and are offered discounted tickets to selected performing arts events throughout Arizona, invited to monthly lunches and dinners with the dean, and given special access to important contributors to contemporary thought who visit ASU. Each year the college hosts the university's premier scholar-in-residence program, the Centennial Lecture. Past guests include novelist Carlos Fuentes, paleontologist Steven Jay Gould, psychiatrist Robert Coles, microbiologist Lynn Margulis, and essayist Susan Sontag.

The college is home to the John J. Rhodes Chair, designed to bring to the college persons who have significantly contributed to civic life and distinguished themselves as public service leaders. Students have unique opportunities to engage intellectually with these outstanding visiting lecturers. In 1998, the college was honored to have Dr. Henry A. Kissinger serve as the inaugural chair.

ADDITIONAL BENEFITS

The Barrett Honors College and all its facilities and services are fully available to every student, regardless of where he or she lives. The Honors Halls of Residence offer students an integrated living-learning environment; faculty and academic advisors serve the students there. Classrooms, recreational and study lounges, and a computing lab compose the principal facilities of the college.

Students enrolled in the Barrett Honors College receive priority at preregistration and have extended checkout privileges in the campus libraries. Honors courses in disciplinary departments are typically limited to 22 students. Honors courses (with the prefix HON) are usually limited to 18.

Students can receive transcript recognition for lower-division honors studies. Students who meet all upper-division requirements of both their disciplinary college and the Bar-

rett Honors College receive transcript recognition of that accomplishment, as well as special acknowledgment during the graduation ceremonies and collegiate honors convocations.

Participants in the honors college have diverse interests and strong records of success. Many go on to the nation's finest graduate and professional programs, including Chicago, Cornell, Harvard, Michigan, MIT, Northwestern, Stanford, UC-Berkeley, Virginia, Wisconsin, and Yale. Many students have published portions of their honors theses and have presented their work at national and regional meetings of scientific and honors societies.

ADMISSION

Students who have demonstrated high levels of academic achievement at the high school or university level are invited to apply for admission to the Barrett Honors College. All candidates for admission must file a separate application to the college.

Applicants are initially evaluated on the basis of their high school GPA (Arizona Board of Regents GPA based on 16 competency courses), high school class rank, and performance on the SAT or ACT; or a student may possess other talents that contribute to academic leadership and community service. Continuing ASU or transfer students are evaluated on their college GPA.

The typical first-year student in the college has the following profile: high school GPA of 3.80; top five percent of his or her high school graduating class; and 29 composite on the ACT or 1300 composite on the SAT.

A typical transfer or continuing student will have completed at least 12 semester hours with a 3.50 GPA or better. Community college transfer students who have graduated from their institution's honors programs are encouraged to apply.

All students who believe they can better succeed at the university by participating in the Barrett Honors College are encouraged to apply. Application forms and additional information about the college and its activities are available by calling 480/965-9155.

RETENTION

Honors students must maintain high standards of academic performance and show progress toward completion of graduation requirements in their disciplinary majors and the Barrett Honors College. Students must complete an average of one honors course each semester. The associate dean of the college must approve any deviation from this standard. Good standing in the college requires students to maintain the following cumulative ASU GPAs (4.00 = A):

1. less than 45 semester hours, 3.25;
2. between 45 and 80 semester hours, 3.33; and
3. above 80 semester hours, 3.40.

A student with a lower cumulative ASU GPA is placed on probation and is withdrawn from the college if he or she does not make reasonable progress in raising the cumulative GPA during the following semester. Students who fail to complete at least one honors course in two semesters may be placed on inactive status. A student on inactive status within the college is not eligible for honors housing, extended library privileges, early registration, or honors internship placement. Reinstatement to active status

requires a formal application and appointment with an honors advisor.

COURSE REQUIREMENTS

Only courses in which a student earns at least a grade of “C” may be used to meet the Barrett Honors College requirements.

Freshmen and students entering the college with fewer than 45 semester hours of course work must take HON 171 and 172 the Human Event. This cross-disciplinary seminar acquaints them with ideas that form the foundation of a university education and emphasizes critical thinking, discussion, and writing.

Students entering the college after completing 45 semester hours must take a 300-level honors course; junior-level seminar courses introduce them to critical thinking, discussion, and writing in a topical area chosen by the instructor.

Departmental courses carrying footnote number 19 in the *Schedule of Classes* are limited to honors students and others who receive special permission from the instructor to enroll. Enrollment in these courses is limited. Compared to their non-honors equivalents, these courses are designed to offer a richer, more complex intellectual experience appropriate to the discipline and the level of the course for all students enrolled. Other disciplinary honors courses group honors students in small cohorts to work on research projects of common interest.

Departmental courses carrying footnote number 18 in the *Schedule of Classes* allow honors students to contract with the instructor of designated non-honors courses to earn honors credit by pursuing enrichment activities, which may include supplemental sessions with the instructor. Footnote 18 contracts must be filed during the first four weeks of class and completed during the semester in which the course

is offered. Each contract form offers guidelines to aid students and faculty in developing appropriate contracts.

Course numbers listed in the *Schedule of Classes* as 298, 492 Honors Directed Study, 493 Honors Thesis, 497 Honors Colloquium, and all classes with the HON prefix are reserved for students in the Barrett Honors College and always carry footnote 19. Students may receive credit for more than one of each of these courses in a given department.

Departmental courses with the number 493 are reserved for honors students completing their honors theses. A student may enroll for these courses only with the approval of the sponsoring academic department and of the faculty member who serves as the student’s thesis director. Course numbers listed in the *Schedule of Classes* as 493 fulfill the student’s literacy and critical inquiry (L) General Studies requirement. Students in the honors college may also enroll in graduate-level courses that automatically earn honors credit.

All courses a student takes for honors credit may be used toward graduation, even if the student does not graduate from the Barrett Honors College.

HONORS TRANSCRIPT RECOGNITION

All courses used to fulfill lower-division or upper-division/graduation requirements for the Barrett Honors College must carry earned letter grades of at least “C.” A “Y” grade does not meet college requirements.

Lower Division

To receive transcript recognition for lower-division honors work, students must complete 18 semester hours of honors course work within 60 earned semester hours with a cumulative ASU GPA greater than or equal to 3.40 (4.00 = A).



Main entrance to Hayden Library

Jean Laaninen photo

Courses *must* include HON 171 and 172 the Human Event. Courses that earn automatic honors credit, although not carrying a footnote number 19 in the *Schedule of Classes*, include ENG 105 (any section) and CHM 117 and 118 (any section).

Students may apply upper-division honors course work toward lower-division requirements; however, those classes may not also be used to meet the Barrett Honors College upper-division/graduation requirements.

Upper Division/Graduation

To graduate from the Barrett Honors College, students must

1. complete HON 171 and 172 the Human Event for continuing ASU or transfer students with less than 45 hours of credit *or* one of the 300-level honors seminar courses for continuing or transfer students with 45 or more hours of credit;
2. complete 18 additional semester hours of upper-division honors course work for an earned letter grade, which must include three to six semester hours of Honors Thesis and six semester hours outside the academic major (these may include graduate courses);
3. complete ASU graduation requirements in an academic major; and
4. earn a cumulative ASU GPA greater than or equal to 3.40 (4.00 = A).

The Craig and Barbara Barrett Honors College

Ted Humphrey
Dean
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www.asu.edu/honors

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HUMPHREY

SENIOR LECTURERS
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LECTURERS
BEGGS, BRUHN, BURKE, HEINDL, LYNCH, McMANUS,
PICKUS, RANERO-ANTOLIN, SUSSER

HONORS (HON)

HON 171 The Human Event. (3)

fall and spring

Landmarks in the social and intellectual development of the human race, with emphasis on Western civilization. Enrollment restricted to members of the Barrett Honors College. Consult the college for applicability to disciplinary college distribution requirements.

General Studies: L/HU, H

HON 172 The Human Event. (3)

fall and spring

Continuation of HON 171, with emphasis on the Renaissance through the modern period.

General Studies: L/HU, H

HON 371 Freedom and Authority. (3)

fall and spring

Historical overview of concepts of liberty, responsibility, and power in Western societies, emphasizing 18th- to 20th-century developments. Seminar.

General Studies: L/HU

HON 372 French Cultural Influences. (3)

summer session 1

Explores textual and cultural artifacts formative of French culture as a series of contacts and conflicts with other peoples and lifeways. Seminar.

General Studies: L/HU, G

HON 373 Heroes, Heroines, and Villains. (3)

fall and spring

Examines concepts of heroic and villainous characteristics as expressed in the literature and visual arts of various cultures throughout history. Seminar.

General Studies: L/HU

HON 374 Black and White Atlantic. (3)

fall and spring

Examines development (18th- to 20th-century) and cultural manifestations of Black/White race relations within the U.S. and between the U.S. and other nations. Seminar.

General Studies: HU, G, H

HON 375 Science and the Modern Self. (3)

fall and spring

Concentrates on texts of the 19th and 20th centuries; explores how scientific discourse determines our notions of self. Seminar, lecture, discussion.

General Studies: L/HU

HON 376 Law, Literature, and Life. (3)

fall and spring

Multidisciplinary approach to the subject of law, examining it through literature, history, and legal philosophy. Seminar.

General Studies: L/HU

HON 394 Special Topics. (3)

fall, spring, summer

HON 485 Biosphere 2—Study Opportunity. (1–18)

fall and spring

For students participating in the ASU-sponsored program at Biosphere 2.

HON 493 Honors Thesis. (1–6)

not regularly offered

General Studies: L/HU

College of Architecture and Environmental Design

John Meunier, M.Arch., Dean

www.asu.edu/caed



College of Architecture and Environmental Design/North

John MacIsaac photo

PURPOSE

The practice of architecture and environmental design is the culturally responsible shaping of our environment—from the scale of the cities in which we live to the buildings and interiors we inhabit and the artifacts and products we use. What we design must be durable, useful, beautiful, appropriate to its context, and not a waste of resources, energy, or materials. Designing our environment is an art, a technology, and a social science that has a history as long as human culture. The goals of the faculty include offering students an education that becomes the basis for life-long growth and improvement as professionals, advancing the discipline in both theory and practice, and improving the quality of the environment by making the expertise and knowledge of the faculty available to other professionals and to the public.

ORGANIZATION

Academic Organization. The college is composed of three academic units:

- School of Architecture
- School of Design
- School of Planning and Landscape Architecture

Administration of the college is the responsibility of the dean, who in turn is responsible to the president of the university through the senior vice president and provost.

College Facilities. All of the College of Architecture and Environmental Design's programs are housed in a single complex. Facilities include the Architecture and Environmental Design Library; computer laboratories; design studios; the Gallery of Design; lecture and seminar rooms; the Media Center; offices for faculty, the administration, and student organizations; the shop; the slide collection; Materials Resource Center; and technology laboratories. The bridge between the original building and the expansion places the college's review and display space at the heart of the complex.

Architecture and Environmental Design Library. As a branch of the University Libraries, the Architecture and Environmental Design Library provides easy access to more than 30,000 books, periodicals, and reference materials for students, faculty, and the professional community. The library's special collections include archives of Blaine Drake, Victor Olgyay, Calvin Straub, Will Bruder, and others, as well as research materials on Paolo Soleri and Frank Lloyd Wright. The Alternative Energy Collection and the Materials Resource Center provide additional sources for research.

School of Architecture	122
School of Design	130
School of Planning and Landscape Architecture	139

College of Architecture and Environmental Design Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Architectural Studies	B.S.D.	—	School of Architecture
Design Science ¹	B.S.D.	—	School of Design
Graphic Design	B.S.D.	—	School of Design
Housing and Urban Development	B.S.D.	—	School of Planning and Landscape Architecture
Industrial Design	B.S.D.	—	School of Design
Interior Design ²	B.S.D.	—	School of Design
Landscape Architecture	B.S.L.A.	—	School of Planning and Landscape Architecture
Urban Planning	B.S.P.	—	School of Planning and Landscape Architecture

¹ Applications for this program are not being accepted at this time.

² This major requires more than 120 semester hours to complete.

Gallery of Design. The Gallery of Design is one of eight university galleries and museums. It provides space for traveling exhibits and exhibitions of student and faculty work.

Special Facilities. College programs are supplemented by several special laboratories, including the computer-aided design and graphics lab; the high-bay research lab; the lighting lab; the solar research lab; the solar rooftop work area; an extensive shop equipped to handle wood, plastic, and metal; the Herberger Center for Design Excellence; and the Joint Urban Design Program, which also has a studio at the ASU Downtown Center. The Media Center includes traditional graphics and audiovisual equipment as well as portable gear. The slide collection, with more than 100,000 images, is available for instructional use, and the college maintains an array of materials testing equipment.

ADMISSION

Lower-Division Programs. A new or transfer student who has been admitted to the university and has selected a college major is admitted to the lower-division program of his or her choice. A separate application procedure is required for entry to upper-division programs and graduate programs. Acceptance into lower-division programs does not guarantee acceptance to upper-division programs. Acceptance into lower-division programs requires a TOEFL score of 500 or higher for international students whose native language is not English.

Transfer Credits. While the university accepts credits transferred from other accredited institutions, transfer credits are not applied to specific degree programs until reviewed and accepted by the appropriate academic units. Transfer course work must be equivalent in both content and level of offering. In addition, a review of samples of work (portfolio format) from previous studio classes is required. Students who change majors to transfer into the college or one of its program areas must have a minimum cumulative GPA of 2.50.

Upper-Division Programs. Admission to upper-division programs is competitive. Consult requirements of each major for details. Students applying to more than one program must make a separate application to each and must submit separate portfolios. Students not enrolled at ASU when they apply to upper-division programs must also make a separate application to the university. Students not admitted to the upper division are not dismissed from the univer-

sity and may reapply or transfer to other programs. Students who plan to reapply should contact a college academic advisor. Transfers into upper-division programs are considered only if vacancies occur, and such transfers are limited to students with equivalent course work who are competitive with continuing students. Acceptance into some upper-division programs requires a TOEFL score of 500 or higher for international students whose native language is not English.

ADVISING

While the college and its academic units provide academic advising, *it is ultimately the responsibility of each student to fulfill academic and program requirements.* Advising and record keeping for lower-division programs are the responsibility of a college academic advisor (located in ARCH 141). Records for upper-division program students are kept in the appropriate academic units, and advising is by the faculty and the head of the academic unit. General career advising is available from all faculty members. Administration of program requirements is the responsibility of the head of the academic unit and the dean.

Appeals Procedures. Academic appeals and requests for variances are typically made first to the student's advisor and then, if necessary, to the head of the appropriate academic unit, the Governance and Grievance Committee, and, finally, the dean. A student who feels unjustly treated in academic or other matters relating to his or her career as a student may contact a college academic advisor or may take the grievance to the college ombudsperson.

DEGREES

Undergraduate. The college offers curricula for four- or five-year degree programs: the Bachelor of Science in Design (B.S.D.) degree in Architectural Studies, Graphic Design, Housing and Urban Development, Industrial Design, and Interior Design; the Bachelor of Science in Landscape Architecture (B.S.L.A.) degree; and the Bachelor of Science in Planning (B.S.P.) degree in Urban Planning. Applications for the B.S.D. degree in Design Science are not being accepted at this time. For more information, see the "College of Architecture and Environmental Design Baccalaureate Degrees and Majors" table, on this page.

Each undergraduate program is divided into lower-division and upper-division programs. Completion of a lower-division program does not guarantee advancement to an upper-division program.

College of Architecture and Environmental Design Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Architecture	M.Arch.	—	School of Architecture
Building Design	M.S.	Computer-aided design, energy performance and climate-responsive architecture, facilities development and management	School of Architecture
Design	M.S.D.	Graphic design, industrial design, interior design	School of Design
Environmental Design and Planning	Ph.D.	Design; history, theory, and criticism; planning	College of Architecture and Environmental Design
Environmental Planning*	M.E.P.	Landscape ecological planning, urban and regional development, urban design	School of Planning and Landscape Architecture

* Doctoral courses for these interdisciplinary programs administered by ASU Main are also offered at ASU East.

MINORS

The faculty in the School of Planning and Landscape Architecture offer a minor in Urban Planning. See “Minors,” page 140, for more information. The faculty in the School of Design offer a minor in Interior Design History. See “Minor,” page 136, for more information.

GRADUATE PROGRAMS

The faculty in the College of Architecture and Environmental Design offer the National Architectural Accrediting Board-accredited Master of Architecture (M.Arch.) professional degree; Planning Accreditation Board-accredited Master of Environmental Planning (M.E.P.) professional degree; M.S. degree in Building Design; Master of Science in Design (M.S.D.) degree; and Ph.D. degree in Environmental Design and Planning. For more information, see the “College of Architecture and Environmental Design Graduate Degrees and Majors” table, on this page, and the *Graduate Catalog*.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university’s three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see “ASU Extended Campus,” page 683, or access the Web site at www.asu.edu/xed.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students seeking a bachelor’s degree must meet all university graduation requirements. See “University Graduation Requirements,” page 74.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 semester hours of approved course work in General Studies, as described under “General Studies,” page 78. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses. General Studies courses are listed in the “General Studies Courses” table, page 81, in the course descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

COLLEGE DEGREE REQUIREMENTS

College of Architecture and Environmental Design degree requirements supplement the General Studies requirement. Each curriculum offered by the college includes sufficient approved course work to fulfill the General Studies requirement.

To be eligible for the Bachelor of Science in Design (B.S.D.), Bachelor of Science in Landscape Architecture (B.S.L.A.), or Bachelor of Science in Planning (B.S.P.) degrees in the college of Architecture and Environmental Design, a student must have

1. attained a cumulative GPA of 2.00 or higher for all course work taken at ASU;
2. earned a “C” or higher in each studio course; and
3. met all university degree requirements.

MAJOR REQUIREMENTS

Students seeking the Bachelor of Science in Design degree must satisfactorily complete a curriculum of 120 or 150 semester hours, depending on the major. The Bachelor of Science in Planning degree requires 120 semester hours. The Bachelor of Science in Landscape Architecture degree requires 120 semester hours. Students majoring in Interior Design must take 150 semester hours. All other majors require 120 hours.

Special Honors at Graduation. At the time of graduation, students with academic distinction are awarded the respective designation *cum laude*, *magna cum laude*, or *summa cum laude*. For more information, see “Graduation with Academic Recognition,” page 77.

ACADEMIC STANDARDS

Lower-Division Retention Standards. A student in one of the college’s lower-division programs is placed on probation when he or she fails to maintain a cumulative GPA of 2.00. Students on probation must observe rules or limitations the college imposes on their probation as a condition of retention. If, after one semester on probation, the overall GPA is not at least 2.00 and the conditions of probation have not been met, the student is disqualified for a minimum of two full academic semesters. Appeals may be made to the college Governance and Grievance Committee. For more information, see “Retention and Academic Standards,” page 71.

Upper-Division Retention Standards. Students in upper-division programs are placed on probation when *any* of the following occur:

1. failure, incomplete, or withdrawal from any required course;
2. a semester GPA below 3.00;
3. a grade of “D” or “E” in a design studio, a design laboratory, or a design lecture; or
4. violation of the college *Code of Student Responsibilities* or any admission agreement.

Students on probation must observe rules or limitations that the college or academic unit places on their probation as a condition of continuation. Students may be removed from a program (but not necessarily the university) if

1. the requirements imposed are not met or the probationary semester GPA is below 3.00 after one semester on probation;
2. failures or withdrawals in required courses are not resolved at the next offering of the course;
3. they fail or withdraw from required sequential courses; or
4. incompletes in required sequential courses are not completed before the first day of class of the next semester.

A student removed from a program is not guaranteed reinstatement in the program even if probation requirements or requirements placed on readmission are fulfilled. Appeals may be made first to the appropriate academic unit and, if necessary, to the college Governance and Grievance Committee. For more information, see “Retention and Academic Standards,” page 71.

Incompletes. It is the student’s responsibility to contact the instructor regarding the process of requesting and fulfilling an incomplete. Tardiness in contacting the instructor may result in a failing grade. Students must obtain an official “Request for Grade of Incomplete” form from their academic units. The completed form must include a justification, a listing of requirements that have not been fulfilled, and a proposed schedule of completion. The instructor reviews the request, proposes modifications if necessary, and submits a copy of the request to the appropriate pro-

gram head (for upper-division students) or a college academic advisor (for lower-division students). An incomplete in an upper-division course that is a prerequisite for sequential courses automatically places the student on probation and denies enrollment in subsequent courses. For more information, see “Incomplete,” page 67.

Withdrawals. University withdrawal regulations apply to lower-division courses. In addition, because the college’s upper-division curricula are modular and sequential and because space in the programs is limited, a student is expected to progress through the curriculum with his or her class. Withdrawal from a required upper-division course automatically places a student on probation. Withdrawal from a required upper-division course in a required sequence automatically removes the student from the program beginning the subsequent semester. For more information, see “Grading System,” page 67.

Credit/No Credit. The only courses accepted toward graduation with a grade of pass/fail or credit/no credit are internships and field studies.

Foreign Study. The College of Architecture and Environmental Design maintains active communications with several foreign institutions offering professional course work similar to the programs of the college. This opportunity is available for students who wish to pursue professional studies at a foreign institution in lieu of resident course work for up to one academic year. Any interested student is encouraged to inform the head of his or her academic unit at the earliest possible date of any intentions for foreign study.

Exchange programs currently exist with the Stuttgart University, Germany; Wageningen Agricultural University, the Netherlands; the University of Valladolid, Spain; the University of British Columbia, Canada; and the Autonomous University of Guadalajara, Mexico. Foreign study programs in France, Italy, and Spain and summer off-campus courses are offered by the School of Architecture. The School of Planning and Landscape Architecture offers a summer landscape planning course in Europe.

Students are also encouraged to consider foreign travel for either a semester or an entire academic year. A leave of absence must be requested for foreign study and foreign travel. Each academic unit reserves the right to evaluate the content and the student’s competency in each of the courses completed at foreign institutions.

Internship. Upper-division students in the college are required to complete an internship program during the summer, normally between the third and fourth years of study.

Attendance. Attendance is expected at all classes, laboratories, and seminars and is a criterion for evaluating performance. Absences and missing work due to absences may result in failure of a course or academic probation. A student may not be excused from attending a class except for medical reasons or other serious personal conditions beyond his or her control. Requests for special consideration must be submitted in writing to the instructor. If accepted, a student may be allowed to take a late or special examination or to submit missing work. Tardiness in contacting the instructor is cause for denying acceptance. For university policy



Interior Design student Emily Chang finishes her model of a facility for autistic children and adults.

Tim Trumble photo

regarding religious holidays, see “Equal Opportunity and Affirmative Action,” page 20.

Employment. It is difficult for students in professional programs to carry part-time employment while in school. Acceptance to any of the college’s upper-division programs presumes a commitment of a minimum of eight hours a day

for professional studies. Prior work experience is not a requirement for admission to upper-division programs.

Retention of Student Work. The college reserves the right to retain any or all projects or work submitted to meet course requirements for the college’s future use in instruction, publication, and exhibition.

Student Leave of Absence. Upper-division students who withdraw from classes or do not continue sequentially in enrollment must request both a leave of absence and readmission in writing from the head of the appropriate academic unit. Leaves of absence are for one-year increments and may be approved for personal reasons, travel, work, or additional study in other disciplines. A student on leave must make the written request for readmission before May 1 for the fall semester of the year of return or before November 1 for the spring semester so that a space may be reserved. Failure to request a leave of absence may result in removal from the program.

STUDENT RESPONSIBILITY

The purpose of this code is to promulgate standards of conduct for students of the College of Architecture and Environmental Design and to establish procedures for reviewing violations. Students are expected to support and maintain the highest professional standards with regard to their individual conduct and their personal and common environments in the college. Copies of the *Code of Student Responsibilities* are available from the Office of the Dean and a college academic advisor.

SPECIAL PROGRAMS

The college and its academic units regularly sponsor lecture series, symposia, and exhibits. In addition, faculty and students attend regional and national meetings of educators and professionals. Academic units sponsor student awards programs and regularly invite professionals and critics to reviews of student projects. The college also participates with the Barrett Honors College, offering courses accepted in that college.

GENERAL INFORMATION

Accreditation. Most states require that an individual intending to become an architect hold an accredited degree. There are two types of degrees that are accredited by the National Architectural Accrediting Board (NAAB): (1) the Bachelor of Architecture, which requires a minimum of five years of study, and (2) the Master of Architecture, which requires a minimum of three years of study following an unrelated bachelor's degree or two years following a related preprofessional bachelor's degree. These professional degrees are structured to educate those who aspire to registration/licensure as architects.

The four-year preprofessional degree, where offered, is not accredited by NAAB. The preprofessional degree is useful for those wishing a foundation in the field of architecture, as preparation for either continued education in a professional degree program or for employment options in architecturally related areas. For more information, see "Accreditation and Affiliation," page 693.

Dean's List. Undergraduate students who earn 12 or more graded semester hours ("A," "B," "C," "D," or "E") during a semester in residence at ASU with a GPA of 3.50 or higher are eligible for the Dean's List. A notation of achieving the distinction of being listed on the Dean's List appears on the final grade report for that semester.

College of Architecture and Environmental Design

Alumni Association. The College of Architecture and Environmental Design Alumni Association encourages graduates to contribute to the college by acting as liaisons among the college community, students, and practicing professionals. The college also calls on the members of the Architecture Guild of Arizona State, the Arizona Design Institute, the Council for Design Excellence, and the Planning Advisory Committee for advice and to promote the goals of the college.

Council for Design Excellence. The Council for Design Excellence has been created to consolidate a partnership between the College of Architecture and Environmental Design and key community leaders who share a vital interest in the development of high quality in the built environment of the Phoenix metropolitan area. By joining together professionals, business and civic leaders, students, and faculty in a common pursuit of design excellence, the council seeks to make a profound difference in the quality of life.

Affiliations. For information on affiliations maintained by the college, see "Accreditation and Affiliation," page 693.

Student Professional Associations. The purpose of the student associations is to assist students with the transition into professional life and to acquaint them with the profession relating to their program of study. These include the following associations:

- American Institute of Architecture Students
- College of Architecture and Environmental Design Pre-Studies Organization
- Student Association of the College of Architecture and Environmental Design
- Student Association of Interior Designers (ASID, IALD, IFDA, IFMA, IIDA)
- Student Chapter/American Planning Association
- Student Chapter/American Society of Landscape Architects
- Student Chapter/Industrial Designers Society of America
- Student Chapter/Society of Environmental Graphic Designers
- Student Chapter/Society for Range Management
- Student Chapter/Soil and Water Conservation Society
- Student Chapter/Wildlife Society

School of Architecture

Ron McCoy
Director
 (AED 162D) 480/965-3536
www.asu.edu/caed/architecture

REGENTS' PROFESSOR COOK

PROFESSORS

HOFFMAN, McCOY, MEUNIER, OZEL, ROTONDI,
 SCHEATZLE, UNDERHILL, UNDERWOOD

ASSOCIATE PROFESSORS

BRYAN, ELLIN, HARTMAN, KROLOFF,
 KUPPER, LOOPE, VAN DUZER, ZYGAS

ASSISTANT PROFESSORS

CAICCO, HAHN, HEJDUK, LERUM, MURFF,
 PETRUCCI, SOROKA, SPELLMAN

PURPOSE

The architecture program at ASU offers an integrated curriculum of professional courses and focuses on the design laboratory. The program reflects an awareness of the complex factors affecting the quality of the built environment. The program seeks through scholarship, teaching, research, design, and community service to develop the discipline and the knowledge necessary to address the important environmental and design issues faced by society.

In addition to developing knowledge and skills in architectural design, building technology, and professional practice, students are encouraged to select electives from a broad range of approved courses both within the college and across the university. These electives may be selected to devise a minor, to further professional study, or in some other fashion to enrich the student's academic experience.

ORGANIZATION

The School of Architecture's program is organized by the faculty under the direction and administration of the director and standing committees of the faculty.

DEGREES

The faculty in the School of Architecture offer the Bachelor of Science in Design degree with a major in Architectural Studies.

The program in architecture culminates with the professional degree Master of Architecture, which is accredited by the National Architectural Accrediting Board (NAAB). Completion of the program is intended to take six years.

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The NAAB, which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its

degree of conformance with established educational standards.

Master's degree programs may consist of a preprofessional undergraduate degree and a professional graduate degree, which, when earned sequentially, compose an accredited professional education. However, the preprofessional degree is not, by itself, recognized as an accredited degree.

Admission to the professional program in architecture is competitive and begins after completion of lower-division requirements, as described in "Admission," on this page and "Degree Requirements," page 124. The professional program includes two years of upper-division study leading to the Bachelor of Science in Design (B.S.D.) and two years of graduate study leading to the Master of Architecture, as described in "Upper-Division Professional Program," on this page.

Applicants who already hold a bachelor's degree in another field should apply to the 3+ year Master of Architecture degree program. See the *Graduate Catalog* for more information.

In cooperation with the Barrett Honors College, the school offers a special honors curriculum for students with Barrett Honors College standing. Consult the advising officers in the school for information.

ADMISSION

Lower-Division Program. New and transfer students who have been admitted to the university and who have selected Architectural Studies as their major are admitted to the lower-division architecture program without separate application to the School of Architecture. Completion of lower-division requirements does not ensure acceptance to the upper-division professional program.

Transfer credits for the lower-division program are reviewed by the college faculty. To be admissible to this curriculum, transfer courses must be equivalent in both content and level of offering. A review of samples of work is required for studio classes. Consult a college academic advisor for an appointment.

Entering lower-division students who are not prepared to enroll in some of the required courses are required to complete additional university course work. These additional prerequisite courses do not apply to the Bachelor of Science in Design degree requirements.

Upper-Division Professional Program. Admission to the upper-division professional program is competitive and limited by available resources. Admission is awarded to those applicants demonstrating the highest promise for professional success.

Transfer students who have completed the equivalent required lower-division course work may apply to the upper-division program. Prior attendance at ASU is not required for application to the upper-division program.

To be eligible for admission to the upper-division program, the following requirements must be met:

1. admission to ASU (note that application and admission to ASU are separate from application and admission to the upper-division program);
2. completion of lower-division requirements or equivalents as approved by a college academic advisor and the faculty of the school;

3. a minimum university cumulative GPA of 3.00 as well as a 3.00 GPA based only on the required lower-division courses or equivalents; and
4. submission of a portfolio (for detailed information about this requirement, see "Portfolio Format Requirements," on this page.

In an unusual circumstance, when the admission standard deficiency is slight, written evidence of extenuating circumstances is convincing, and promise for success is evident, a student may be granted admission to the upper division on a *provisional* basis.

Students not admitted to the upper-division program are not dismissed from the school and may reapply or may transfer to other programs. Students who intend to reapply should meet with a college academic advisor.

Applications for transfer into the upper-division professional program are considered only if vacancies occur. Transfer applicants must demonstrate that equivalent course work has been completed, and applicants must be academically competitive with continuing students.

Students who successfully complete the upper-division requirements receive the Bachelor of Science in Design degree in Architectural Studies. This is not a professional degree. To complete the professional architecture program, students must attain the NAAB-accredited Master of Architecture degree. Students who receive the B.S.D. are eligible to apply for the graduate program and should see the *Graduate Catalog* for proper application procedures. This application process is competitive and based on a thorough review of a student's undergraduate preparation and performance.

Students with the four-year Bachelor of Science in Design degree (with a major in Architectural Studies or an equivalent degree from another school that offers an accredited professional degree in architecture) should apply directly to the graduate program.

APPLICATION TO UPPER-DIVISION PROGRAMS

Upper-Division Application Procedures. Students should write to a college academic advisor for the application form well in advance of the application deadline. For more information on portfolios, ask for a copy of the *Portfolio Seminar* brochure from a college academic advisor. The following dates and procedures are for students applying to 2002–2003 upper-division programs.

Upper-Division Application Deadlines. April 26, 2002.

Portfolio and application documents are due in the school office by 5 P.M.

June 3, 2002. If the spring 2002 semester includes transfer course work (i.e., course work taken at an institution other than ASU), a student must submit his or her transcripts to the school no later than June 3. These transcripts may be unofficial copies. A second set of official transcripts must be sent to the university Undergraduate Admissions office. Application is not complete until the university receives official transcripts for transfer course work. For those transfer students whose academic term ends in June rather than

May, this deadline may be extended upon the written request of the applicant.

July 1, 2002. Acceptance notices are mailed no later than July 1.

Return of Letter of Acceptance. A signed receipt of acceptance of admission must be received by the school by the date indicated on the Notice of Acceptance. Alternates may be accepted at a later date if space becomes available.

Matriculation. An accepted student is expected to begin his or her upper-division professional program at the beginning of the immediate fall term. There is no spring admission to the upper division.

Portfolio Format Requirements. Each applicant is responsible for obtaining the following documents and including them in the portfolio. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8.5" x 11" format only). Items must appear in the following order:

Page 1. The application form should be completely filled out with the first page visible. Application forms are available from the college Academic Advising Office.

Page 2. The second page of the application should be visible.

Page 3. Application Essay. The student's name should not appear on the essay.

Page 4. All college transcripts for both ASU and transfer work should be included through the fall 2001 semester. Copies are acceptable. An academic advisor forwards 2002 ASU transcripts. (Applicants wishing to transfer work are responsible for submitting these transcripts by June 3 so that they may be added to their portfolios. The student is also responsible for getting an official transfer transcript sent directly to the Office of the Registrar.)

Page 5. A certificate of admission is necessary only for those students who have been newly admitted for fall 2001 and who are applying directly into an upper-division program. The certificate is not required for students currently attending ASU.

Following Pages (Usually from 10 to 20 Sheets). Students should present work sufficient to demonstrate the depth and breadth of their creative activity. This work should include (but is not limited to) examples of two- and three-dimensional design and graphics. Each project should be clearly identified (course, length of project, etc.), with a concise accompanying description of the assignment.

Students should obtain a portfolio requirements addendum for their major from the college's Academic Advising Office, ARCH 141, at the beginning of the academic year in which they intend to apply to the upper-division program. Requirements or instructions indicated in the addendum for that academic year take precedence over any other printed material.

Students are encouraged to include additional materials, written or pictorial, that provide additional evidence of skills and abilities and of the aptitude and commitment to the major. When any work submitted is not completely original, the source must be given. When work is of a team

nature, the applicant's role should be clearly indicated. Original examples or slides must not be submitted. All examples must be photographs or other reproduction graphic media.

Return of Portfolios. Application documents (pages 1–5) remain the property of the College of Architecture and Environmental Design. However, the remaining portfolio is returned after the admissions review, provided the applicant encloses a self-addressed return mailer with sufficient pre-paid postage. Portfolios may be claimed in person after July 1, 2002. If the applicant provides written permission, another person may claim the portfolio. After one year, unclaimed portfolios are discarded. While care is taken in handling the portfolios, no liability for lost or damaged materials is assumed by the college or school.

ADVISING

Advising for the lower-division curriculum is through the college Academic Advising Office. Advising for upper-division students is by assigned faculty advisors and administrative personnel from the School of Architecture.

DEGREE REQUIREMENTS

The Bachelor of Science in Design degree in Architectural Studies requires a minimum of 120 hours of course work. Most lower-division students pursue option A; however, those who intend eventually to seek an advanced degree in either engineering or building science are encouraged to fulfill the requirements outlined in option B.

Option B students who intend to pursue graduate degrees in an engineering discipline should consult with the College of Engineering and Applied Sciences advising office for any additional requirements.

GENERAL STUDIES REQUIREMENT

The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See "General Studies," page 78, for requirements and a list of approved courses. Note that all three General Studies awareness areas are required. Consult an advisor for an approved list of courses.

GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation and college degree requirements. See "University Graduation Requirements," page 74, and "College Degree Requirements," page 118.

The accredited professional degree Master of Architecture requires an additional 56 hours of approved graduate-level course work. For more information, see the *Graduate Catalog*.

Architectural Studies—B.S.D. Lower-Division Requirements Option A¹

First Year

Fall	
APH 100 Introduction to Environmental Design <i>HU, G, H</i>	3
or ADE 120 Design Fundamentals I ² (3)	
ENG 101 First-Year Composition	3
Approved elective	3
Approved elective (MAT 170 Precalculus may be needed)	3

SB elective	3
Total	15

Spring

ADE 120 Design Fundamentals I ²	3
or APH 100 Introduction to Environmental Design <i>HU, G, H</i> (3)	
ENG 102 First-Year Composition	3
MAT 210 Brief Calculus <i>MA</i>	3
Approved elective	3
C elective	3
Total	15

Second Year

Fall

ADE 221 Design Fundamentals II ²	3
ADE 223 Design Fundamentals II Lecture	1
APH 200 Introduction to Architecture <i>HU, G</i>	3
PHY 111 General Physics <i>SQ</i> ³	3
PHY 113 General Physics Laboratory <i>SQ</i> ³	1
L elective	3
Total	14

Spring

ADE 222 Design Fundamentals III ²	3
ADE 224 Design Fundamentals III Lecture	1
ANP 236 Introduction to Computer Modeling <i>CS</i>	3
SB elective	3
SG or SQ elective	4
Total	14
Option A lower-division total	58

- ¹ Transfer credits are reviewed by the college and evaluated for applicability to this curriculum. To be applicable, transfer courses must be equivalent in both content and level of offering.
- ² Portfolio review is required for transfer studio work. Submit the portfolio to the Academic Advising Office, ARCH 141.
- ³ Both PHY 111 and 113 must be taken to secure SQ credit.

Architectural Studies—B.S.D. Upper-Division Requirements Option A

Third Year

Fall

ADE 321 Architectural Studio I	5
APH 313 History of Western Architecture I <i>L/HU</i>	3
ATE 353 Architectural Construction	3
Approved elective*	3
Total	14

Spring

ADE 322 Architectural Studio II	5
ANP 331 Programming for Design	3
APH 314 History of Western Architecture II <i>L/HU</i> *	3
ATE 361 Building Structures I	3
Total	14

Summer

ARP 484 Clinical Internship	3
Total	3

Fourth Year

Fall

ADE 421 Architectural Studio III	5
ATE 451 Building Systems I	3
ATE 462 Building Structures II	3
Approved elective*	3

Professional elective	3
Total	17
Spring	
ADE 422 Architectural Studio IV	5
ATE 452 Building Systems II	3
Architectural history elective	3
Elective*	3
Total	14
Option A upper-division total	62
B.S.D. option A minimum total	120

* These courses may be completed before admission into the upper division.

**Architectural Studies—B.S.D.
Lower-Division Requirements
Option B¹**

First Year

Fall	
APH 100 Introduction to Environmental Design <i>HU, G, H</i>	3
ECE 100 Introduction to Engineering Design <i>CS</i>	4
ENG 101 First-Year Composition	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
SB elective	3
Total	17

Spring	
ADE 120 Design Fundamentals I ²	3
ENG 102 First-Year Composition	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ³	3
PHY 122 University Physics Laboratory I <i>SQ</i> ³	1
Total	14

Second Year

Fall	
ADE 221 Design Fundamentals II ²	3
ADE 223 Design Fundamentals II Lecture	1
APH 200 Introduction to Architecture <i>HU, G</i>	3
ECE 210 Engineering Mechanics I: Statics	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ³	3
PHY 132 University Physics Laboratory II <i>SQ</i> ³	1
Total	18

Spring	
ADE 222 Design Fundamentals III ²	3
ADE 224 Design Fundamentals III Lecture	1
ANP 236 Introduction to Computer Modeling <i>CS</i>	3
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	13
Option B lower-division total	62

¹ Transfer credits are reviewed by the college and evaluated for applicability to this curriculum. To be applicable, transfer courses must be equivalent in both content and level of offering.

² Portfolio review is required for transfer studio work. Submit the portfolio to the Academic Advising Office, ARCH 141.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

**Architectural Studies—B.S.D.
Upper-Division Professional Program Requirements
Option B**

Third Year

Fall	
ADE 321 Architectural Studio I	5
APH 313 History of Western Architecture I <i>L/HU</i> *	3
ATE 353 Architectural Construction	3
ECE 212 Engineering Mechanics II: Dynamics	3
Total	14

Spring	
ADE 322 Architectural Studio II	5
ANP 331 Programming for Design	3
APH 314 History of Western Architecture II <i>L/HU</i> *	3
ECE 313 Introduction to Deformable Solids	3
Total	14

Summer	
ARP 484 Clinical Internship	1
Total	1

Fourth Year

Fall	
ADE 421 Architectural Studio III	5
ATE 451 Building Systems I	3
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 351 Civil Engineering Materials	3
Total	14

Spring	
ADE 422 Architectural Studio IV	5
ATE 452 Building Systems II	3
ECE 384 Numerical Methods for Engineers	4
SB and C elective*	3
Total	15
Option B upper-division total	58
B.S.D. option B minimum total	120

* These courses may be completed before admission to the upper-division. If already completed, a student may request to substitute an approved elective.

**Master of Architecture
Graduate-Level Professional Program Requirements**

Fifth Year

Fall	
ADE 521 Advanced Architectural Studio I	5
APH 505 Foundation Theory Seminar	3
ATE 553 Building Systems III	3
ATE 563 Building Structures III	3
Total	14

Spring	
ADE 522 Advanced Architectural Studio II	5
APH 515 Current Issues and Topics	3
ATE 556 Building Development	3
Professional elective*	3
Total	14

Sixth Year

Fall	
AAD 551 Architectural Management I	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ADE 621 Advanced Architectural Studio III	5
ANP 681 Project Development.....	3
Professional elective*	3
Total	14
Spring	
AAD 552 Architectural Management II.....	3
ADE 622 Advanced Architectural Studio IV.....	5
Approved elective	3
Professional elective*	3
Total	14
Graduate division total.....	56

* At least one professional elective must be a CAD course.

COURSES

Subject matter within the school is categorized in the following instructional areas.

Architectural Administration and Management. AAD courses focus on the organizational and management aspects of architectural practice, including management coordination, administrative procedures, ethics, legal constraints, and the economics of practice.

Architectural Design and Technology Studios. ADE courses require the synthesis of knowledge and understanding gained from other course work and develop an understanding of design theory and design skill through a series of comprehensive design projects. Students apply analytical methods, compare alternative solutions, and develop sophisticated technical and conceptual results.

Environmental Analysis and Programming. ANP courses develop the ability to analyze and program environmental and human factors as preconditions for architectural design using existing and emerging methods of evaluation and analysis.

Architectural Philosophy and History. APH courses develop an understanding of architecture as both a determinant and a consequence of culture, technology, needs, and behavior in the past and present. Studies are concerned with the theory as well as the rationale behind methods and results of design and construction. Case studies are both domestic and international.

Architecture Professional Studies. ARP courses provide students with off-campus opportunities, educational experience in group and individual studies relative to specific student interests, and faculty expertise, including summer internships and field trips.

Architectural Technology. ATE courses develop knowledge of the technical determinants, resources, and processes of architecture. These studies focus on the science and technology of design and construction, including materials, building systems, acoustics, lighting, structural systems, environmental control systems, computer applications to design and technology, and both passive and active solar systems. Emphasis is on measurable and quantifiable aspects.

Architectural Communication. AVC courses develop the student's understanding of communication theory as it applies to architectural design and practice as well as skills

in drawing, graphics, photography, presentation design, and the design process.

The courses required in the upper-division and graduate levels of the professional program are not open to nonmajors and students not admitted to the upper-division program.

GRADUATE PROGRAMS

The faculty of the School of Architecture offer a Master of Architecture and a M.S. degree in Building Design. Concurrent application to both degree programs is possible, and each application is evaluated by the respective admission committees separately. Also, a dual career program, Master of Architecture/Master of Business Administration, has been established in cooperation with the College of Business. Also offered is a collegewide, interdisciplinary Ph.D. degree in Environmental Design and Planning with concentrations in design; history, theory, and criticism; and planning. For more information, see the *Graduate Catalog*.

ENVIRONMENTAL DESIGN AND PLANNING (EPD)

See the *Graduate Catalog* for the EPD courses.

ARCHITECTURAL ADMINISTRATION AND MANAGEMENT (AAD)

AAD 551 Architectural Management I. (3)

fall

Design delivery, coordination of construction documents, cost estimating, bidding and negotiations, construction observation, and post construction services. Case studies. Lecture, discussion. Prerequisite: graduate-level standing. Corequisite: ADE 621.

AAD 552 Architectural Management II. (3)

spring

Organizational, human performance, and market influences on architecture firms and projects. Readings, case studies, and analysis of managerial problems and solutions. Lecture, discussion. Prerequisites: AAD 551; ADE 621.

AAD 555 Architect as Developer. (3)

once a year

Development building, real estate, construction funding, land acquisition, and the sources for capital. Prerequisite: instructor approval.

AAD 599 Thesis. (1–12)

not regularly offered

Fee.

AAD 681 Professional Seminar: Capstone. (3)

spring

Examination of ethical, political, social, economic, ecological, and cultural issues confronting the practice of architecture. Readings and case studies. Seminar. Prerequisite: AAD 552. Corequisite: ADE 622.

ARCHITECTURAL DESIGN AND TECHNOLOGY STUDIOS (ADE)

ADE 120 Design Fundamentals I. (3)

fall, spring, summer

Development of visual literacy. Introduction to drawing and graphic representation as methods of seeing and problem solving. Studio. Prerequisite: major in College of Architecture and Environmental Design.

ADE 221 Design Fundamentals II. (3)

fall

Exercises in basic design, stressing creative problem-solving methods, principles of composition, and aesthetic evaluation. Development of vocabulary for environmental design. Lecture, studio. Prerequisite with a grade of "C" or higher: ADE 120.

ADE 222 Design Fundamentals III. (3)

spring

Application of design fundamentals with an emphasis on architectural issues. Lecture, studio. Prerequisite: APH 200. Prerequisite with a grade of "C" or higher: ADE 221.

ADE 223 Design Fundamentals II Lecture. (1)*fall*

Theory and applications of basic design principles, history and theory of how architecture design is impacted by basic design. Lecture, discussion. Prerequisite: ADE 120. Corequisite: ADE 221.

ADE 224 Design Fundamentals III Lecture. (1)*spring*

History and theory of design fundamentals with an emphasis on architectural issues. Lecture, discussion. Prerequisite: ADE 223. Corequisite: ADE 222.

ADE 321 Architectural Studio I. (5)*fall*

Introductory building design problems. Emphasis on design process, communication methods, aesthetics, construction, and technology. Lecture, studio, field trips. Fee. Prerequisite: admission to upper division. Corequisite: ATE 353.

ADE 322 Architectural Studio II. (5)*spring*

Site and building design problems. Emphasis on programmatic and environmental determinants and building in natural and urban contexts. Lecture, studio, field trips. Fee. Prerequisite with a grade of "C" or higher: ADE 321. Corequisite: ANP 331.

ADE 421 Architectural Studio III. (5)*fall*

Topical design problems of intermediate complexity, including interdisciplinary problems. Lecture, studio, field trips. Fee. Prerequisite with a grade of "C" or higher: ADE 322.

ADE 422 Architectural Studio IV. (5)*spring*

Topical design problems of advanced complexity, including interdisciplinary problems. Lecture, studio, field trips. Fee. Prerequisite with a grade of "C" or higher: ADE 421.

ADE 510 Foundation Architectural Studio. (6)*summer*

Fundamentals of architectural design, methodology, visualization, and representation. Lecture, studio, field trips. Fee. Prerequisite: admission to Master of Architecture degree program.

ADE 511 Core Architectural Studio I. (6)*fall*

Application of design fundamentals in architectural problems, including construction, technology, programmatic and environmental determinants. Lecture, studio, field trips. Fee. Prerequisites: APH 200, 509. Prerequisite with a grade of "C" or higher: ADE 510.

ADE 512 Core Architectural Studio II. (6)*spring*

Application of architectural design fundamentals to increasingly complex problems, including specific sites and activities. Lecture, studio, field trips. Fee. Prerequisite with a grade of "C" or higher: ADE 511.

ADE 521 Advanced Architectural Studio I. (5)*fall*

Design problems emphasizing theory, aesthetics, and tectonics as influences on architectural form. Lecture, studio, field trips. Fee. Prerequisite: admission to Master of Architecture degree program.

ADE 522 Advanced Architectural Studio II. (5)*spring*

Design problems emphasizing the comprehensive integration of building systems and technologies as influences on architectural form. Lecture, studio, field trips. Fee. Prerequisite with a grade of "C" or higher: ADE 521.

ADE 621 Advanced Architectural Studio III. (5)*fall*

Design problems emphasizing the urban context, planning issues, and urban design theory as influences on architectural form. Lecture, studio, field trips. Fee. Prerequisite: instructor approval. Prerequisite with a grade of "C" or higher: ADE 522. Corequisite: AAD 551.

ADE 622 Advanced Architectural Studio IV. (5)*spring*

Individual, student-initiated project reflecting a culminating synthesis of architectural ideas. Studio. Fee. Prerequisites with a grade of "C" or higher: ADE 621; ANP 681.

ADE 631 Building Systems Simulation Studio. (5)*fall*

Design of energy-efficient medium and large commercial complexes; synthesis to optimize performance using new and advanced algorithms. Lecture, lab, studio. Prerequisites: ATE 521, 550, 551, 582.

ADE 661 Bioclimatic Design Studio. (6)*once a year*

Sustainable architectural and site synthesis at a variety of scales emphasizing bioclimatic criteria and the use of passive and low-energy systems. Prerequisite: professional degree or instructor approval. Corequisite: ATE 558.

**ENVIRONMENTAL ANALYSIS
AND PROGRAMMING (ANP)****ANP 236 Introduction to Computer Modeling. (3)***fall and spring*

Fundamentals of computer operation, geographic information systems, geometric modeling of three-dimensional forms and rendering of light, mathematical modeling of processes using spreadsheets. Lab. Prerequisite: major in the School of Architecture.

*General Studies: CS***ANP 331 Programming for Design. (3)***spring*

Theory and methods for refracting "constraints" into opportunities for design excellence. Corequisite: ADE 322.

ANP 475 Computer Programming in Architecture. (3)*fall and spring*

Computer programming for architectural problems and applications. Lecture, lab. Prerequisite: CSE 183 (or its equivalent).

ANP 477 Computer Applications to Design Problems. (3)*fall*

Examination of generic microcomputer software in solving architectural design problems. Emphasis on the logic of problem formulation. Lecture, lab. Prerequisite: instructor approval.

ANP 500 Research Methods. (1–12)*not regularly offered*

Fee.

ANP 530 Computer Graphics in Architecture. (3)*once a year*

Fundamentals of computer graphics programming in architecture, including graphics hardware, device-independent packages, 2- and 3-dimensional transformations, and data structures. 2 hours lecture, 3 hours lab. Prerequisite: ANP 475 or instructor approval.

ANP 561 Architectural Information Processing Systems. (3)*once a year*

Applications of information processing systems to architectural problems. Analysis of computing tools with respect to assumptions and theories. Lecture, lab. Prerequisites: graduate standing; instructor approval.

ANP 563 Methods in Architectural Design Computation. (3)*spring*

Concepts and models for research in computer-aided architectural design with an emphasis on computational methods and a system framework. Discussion, lab. Prerequisite: ANP 500 or instructor approval.

ANP 590 RC: Computer Programming and Architecture. (1–12)*not regularly offered***ANP 598 Special Topics. (1–4)***not regularly offered*

Possible topics:

(a) Computer-Aided Design Methods

ANP 599 Thesis. (1–12)*not regularly offered*

Fee.

ANP 681 Project Development. (3)*fall*

Definition and elaboration of major ideas for implementation in ADE 622 in relation to contemporary theory and practice. Seminar. Prerequisite: ADE 522.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ARCHITECTURAL PHILOSOPHY AND HISTORY (APH)**APH 100 Introduction to Environmental Design. (3)***fall and spring*

Survey of environmental design: includes historic examples and the theoretical, social, technical, and environmental forces that shape them. Cross-listed as DSC100/PUP 100. Credit is allowed for only APH 100 or DSC 100 or PUP 100.

*General Studies: HU, G, H***APH 200 Introduction to Architecture. (3)***fall and summer*

Survey of issues and polemics affecting current architectural theory and practice. Lecture, discussion.

*General Studies: HU, G***APH 300 World Architecture I/Western Cultures. (3)***fall*

Historical and contemporary built environments of Western civilizations: Mediterranean, Europe, and the Americas as manifestations of cultural history and responses to environmental determinants. Prerequisite: nonmajor.

*General Studies: HU, G, H***APH 301 World Architecture II/Eastern Cultures. (3)***spring*

Historical and contemporary built environments of Eastern civilizations: Mid-East, Central Asia, Far East, and South Pacific as manifestations of cultural history and responses to environmental determinants.

*General Studies: G***APH 304 American Architecture. (3)***not regularly offered*

Architecture in the United States from earliest colonial times to present. Prerequisite: nonmajor.

*General Studies: HU***APH 305 Contemporary Architecture. (3)***not regularly offered*

Europe and America from the foundations of the modern movement to the present. Prerequisite: nonmajor.

*General Studies: HU***APH 313 History of Western Architecture I. (3)***fall*

Representative buildings and sites with emphasis on their physical and social settings from antiquity through the Middle Ages. Prerequisite: junior standing or instructor approval.

*General Studies: L/HU***APH 314 History of Western Architecture II. (3)***spring*

Representative examples of architecture and urban design with emphasis on their social and historical contexts from the Middle Ages to the present. Prerequisite: APH 313.

*General Studies: L/HU***APH 411 History of Landscape Architecture. (3)***fall*

Physical record of human attitudes toward the land. Ancient through contemporary landscape planning and design. Cross-listed as PLA 310. Credit is allowed for only APH 411 or PLA 310.

*General Studies: H***APH 414 History of the City. (3)***fall*

The city from its ancient origins to the present day. Emphasis on European and American cities during the last five centuries. Cross-listed as PUP 412. Credit is allowed for only APH 414 or PUP 412.

*General Studies: H***APH 441 Ancient Architecture. (3)***not regularly offered*

Architecture of the ancient Mediterranean world with selective emphasis on major historical complexes and monumental sites. Prerequisite: APH 313.

*General Studies: HU***APH 442 Preservation Planning. (3)***fall*

Principles and practices in planning for preservation, conservation and neighborhood redevelopment. Emphasis on evaluation of historic resources. Off-campus field practicum required. Prerequisite: instructor approval.

APH 443 Renaissance Architecture. (3)*not regularly offered*

Selected examples of Renaissance architecture and urbanism with emphasis on their historical and cultural settings. Prerequisite: APH 314.

*General Studies: HU***APH 444 Baroque Architecture. (3)***not regularly offered*

Selected examples of Baroque architecture and urbanism with emphasis on relationships between architecture and other arts. Prerequisite: APH 314.

*General Studies: HU***APH 446 20th-Century Architecture I. (3)***fall*

Architecture in Europe and America from the foundations of the modern movement to the culmination of the international style. Prerequisite: major in college.

*General Studies: HU***APH 447 20th-Century Architecture II. (3)***spring*

Developments in architecture since the international style. Prerequisite: APH 446.

*General Studies: HU***APH 505 Foundation Theory Seminar. (3)***fall*

Foundation of conceptual architectural inquiry, stressing the reciprocal and interdependent relationship between design and theory. Lecture, seminar. Corequisite: ADE 521.

APH 509 Foundation Seminar. (3)*summer*

Historical, technical, theoretical, environmental, and professional issues in architecture. Lecture, seminar, field trips. Prerequisite: ADE 510.

APH 511 Energy Environment Theory. (3)*fall*

Solar and other energy sources in designed and natural environments; architectural, urban, and regional implications of strategies using other renewable resources.

APH 515 Current Issues and Topics. (3)*spring*

Critical examination of current architectural issues, topics, and discourse. Prerequisite: APH 505.

APH 581 Contemporary Urban Design. (3)*spring*

Exploration of the contemporary city and urban design issues related to contemporary cities. Seminar, lecture, discussion. Prerequisite: APH 505.

APH 681 Architectural Theory. (3)*spring*

Examination of architectural theory. Emphasis on application of theory to practice. Seminar. Prerequisite: instructor approval.

APH 682 Architectural Criticism. (3)*fall*

Examination of architectural criticism, emphasizing specific methods of criticism and their application for aesthetic judgment. Seminar. Prerequisite: instructor approval.

APH 683 Critical Regionalism. (3)*not regularly offered*

Critical inquiry in cultural grounding of the definition of place in architectural theory and practice. Lecture, field studies. Prerequisite: APH 446 or 447.

ARCHITECTURE PROFESSIONAL STUDIES (ARP)**ARP 451 Architecture Field Studies. (1–6)***fall, spring, summer*

Organized field study of architecture in specified national and international locations. Credit/no credit. May be repeated with approval of director.

ARP 484 Clinical Internship. (1–3)*summer*

Full-time internship under the supervision of practitioners in the Phoenix area or other locales. Credit/no credit. Prerequisite: instructor approval.

ARP 584 Clinical Internship. (1)*summer*

Structured practical experience following a contract or plan, supervised by faculty and practitioners.

ARP 684 Professional Internship. (2–6)*spring*

Field experience in an architectural firm specializing in an area directly related to the student's advanced study. Integration of theory and state-of-the-art practices. Credit/no credit. Prerequisite: instructor approval.

ARCHITECTURAL TECHNOLOGY (ATE)**ATE 353 Architectural Construction. (3)***fall*

Materials and methods of construction. Aesthetic, code, and cost considerations. Lecture, lab. Corequisite: ADE 321.

ATE 361 Building Structures I. (3)*spring*

Introduction to load distribution on structures. Static analysis of determinant beams, trusses, arches, and rigid frames. Computer applications. Lecture, lab. Prerequisite: admission to upper division.

ATE 451 Building Systems I. (3)*fall*

Principles of solar radiation, heat and moisture transfer, and environmental control systems as form influences. Energy-conscious design. Lecture, lab. Prerequisite: admission to upper division.

ATE 452 Building Systems II. (3)*spring*

Architectural design implications of heating, ventilation, and air conditioning systems. Principles of lighting, daylighting, and acoustics, and their applications. Lecture, lab. Prerequisite: ATE 451.

ATE 462 Building Structures II. (3)*fall*

Strength of materials. Stresses in beams and columns. Thermal effects on structures. Analysis, design, and detailing of wood structural systems. Lecture, lab. Prerequisite: ATE 361.

ATE 521 Building Environmental Science. (3)*fall*

Scientific principles relating to comfort and environmental control. Heat and moisture transfer. Solar/natural energies for heating, cooling, and lighting. Lecture, lab. Prerequisite: MAT 290 (or its equivalent).

ATE 530 Daylighting Design. (3)*spring*

Daylight analysis, availability, design sky measurements, modeling and simulation. Integration with passive heating, cooling, building design, and energy considerations. Lecture, lab.

ATE 550 Passive Cooling and Heating I. (3)*spring*

Theory, analysis, and application of passive and low-energy systems for thermal comfort in buildings emphasizing heating. Prerequisite: ATE 521.

ATE 551 Passive Cooling and Heating II. (3)*fall*

Theory, analysis, and application of passive and low-energy heating systems for thermal comfort in buildings emphasizing cooling. Prerequisite: ATE 550.

ATE 552 Energy Parameters in Buildings. (3)*not regularly offered*

Advanced modeling. Transient and multidimensional analysis of thermal and daylight performance using variable weather data. Prerequisite: ATE 551 or instructor approval.

ATE 553 Building Systems III. (3)*fall*

Design and integration of building systems, including mechanical, electrical, plumbing, security, communications, fire protection, and transportation. Prerequisite: admission to upper division or instructor approval.

ATE 554 Building Energy Efficiency. (3)*spring*

Impact of building design on energy performance. Climate responsiveness, operations dynamics, and subsystems integration in thermal comfort and efficiency. Prerequisite: ATE 452.

ATE 556 Building Development. (3)*spring*

Comprehensive design development through the understanding and integration of building materials and systems. Lecture, seminar. Prerequisites: ATE 462, 553; CAD proficiency. Corequisite: ADE 522.

ATE 557 Construction Documents. (3)*spring*

Production of architectural working drawings; legal status, organization, layout, site survey plans, sections, elevations, details, schedules, and coordination. Lecture, lab. Prerequisite: admission to upper division.

ATE 558 Bioclimatic Parameters. (3)*spring*

Theory, analysis, and application of energy-related parameters of site, climate, human comfort, and building program for design synthesis.

ATE 560 Building Energy Analysis. (3)*fall*

Computer simulation of building thermal behavior. Software review. Detailed study of selected simulation models using case study projects. Lab. Prerequisites: ANP 475 (or 477); ATE 582.

ATE 561 Energy Analysis Techniques. (3)*fall*

Mathematical models of building envelope and comfort conditioning systems as bases for optimization techniques. Prerequisite: ATE 560.

ATE 562 Experimental Evaluation. (3)*once a year*

Instrumentation, measurement and computational techniques for analysis of building components, and assessment of thermal and luminous performance. Fee. Prerequisite: ATE 521.

ATE 563 Building Structures III. (3)*fall*

Analysis, design, and detailing of steel buildings and frames. Lateral analysis of small rigid and braced frame systems. Lecture, lab. Prerequisite: ATE 462 (or its equivalent).

ATE 564 Advanced Structures: Concrete. (3)*once a year*

Analysis, design, and detailing of concrete systems, considering continuity, multistory frames and shear walls, and lateral analysis. Computer application. Prerequisite: ATE 563 or instructor approval.

ATE 565 Advanced Structures: High Rise. (3)*once a year*

Developments in high-rise construction. Effects of wind and seismic forces. Preliminary analysis, design, and detailing considering code requirements. Lecture, lab. Prerequisite: ATE 563 or instructor approval.

ATE 582 Environmental Control Systems. (3)*once a year*

Heating, ventilation, and air-conditioning systems. Loads, psychrometrics, refrigeration cycle, air/water distribution, controls, energy performance standards, and utility rates. 2 hours lecture, 3 hours lab, field trips. Prerequisite: ATE 451 or 521.

ATE 599 Thesis. (1–12)*not regularly offered*

Fee.

ARCHITECTURAL COMMUNICATION (AVC)**AVC 161 Advanced Freehand Perspective Drawing. (2)***not regularly offered*

Introduction to color media, and analytical and design drawing exercises. 4 hours studio. Prerequisite: major in the College of Architecture and Environmental Design.

AVC 294 Special Topics. (1–4)*fall and spring*

Possible topics:

(a) Drawing Module. (1)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

AVC 301 Architectural Communication. (2)*fall*

Communication skills for architecture studios. Emphasis on graphics, drawing conventions, media, computer-aided design, design of presentations, and oral presentations. Lecture, studio. Corequisite: ADE 321.

School of Design

Jacques Giard
Director

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PROFESSORS

BRANDT, GIARD, KROELINGER

ASSOCIATE PROFESSORS

BERNARDI, CUTLER, DETRIE, JOHNSON, McDERMOTT,
PATEL, RATNER, SANFT, WITT

ASSISTANT PROFESSORS

BORADKAR, HARMON-VAUGHAN, HERRING, McCOY,
NIEDERHELMAN, RANDALL, ROTHSTEIN, WEED

PURPOSE

The School of Design educates people for the professional worlds of graphic design, industrial design, and interior design. The curricula focuses on the skills and knowledge that are necessary in these design professions and are undertaken in a learning environment that bridges the academic milieu to the professional world. This direction is further conditioned by the belief that designers have a responsibility to the public and communities they serve. Consequently, students are exposed to a full breadth of learning experiences, from theoretical courses in design history, human factors, and the theories of the profession, to the rigors and demands of the design studio. Students learn to integrate aesthetic values into their designs while considering contextual issues. The goal of the school's academic program is to graduate designers who are accomplished and visually sophisticated and who will continue to evolve in their chosen profession. To this end, the school provides an environment that is conducive to design excellence. It has a faculty of active professionals, excellent facilities and resources, and a network that is international in scope.

More information about the School of Design may be obtained via the Web address provided or by sending electronic mail to caed.advising@asu.edu.

ORGANIZATION

Programs in the School of Design are organized by the faculty of the school under the direction and administration of the director, and standing committees of the faculty.

DEGREES

The faculty in the School of Design offer the Bachelor of Science in Design degree with three majors: Graphic Design, Industrial Design, and Interior Design. Applications are not being accepted to the major in Design Science.

Graphic Design. The Graphic Design program educates and develops students for both the graphic design profession and graduate work. The goal of the faculty is to offer the best graphic design education, allowing the graduating student every option available. Studio classroom projects are planned to strengthen and refine students' proficiency in the language, process, and technical aspects of the profession. Projects are intended to help students think critically, both as individuals and as members of a group. Students opting for the profession can expect to work in the areas of advertising design, brand identity, broadcast graphics, corporate identity, environmental graphics, informational graphics, in-house corporate design, museum informational design, publication design, and Web site design. Students pursuing graduate studies can expect to be equally well prepared with critical and analytical thinking skills coupled with a diversified portfolio. The program is dedicated to a comprehensive education in graphic design as it relates to the changing communication standards of today and in the future.

Industrial Design. The program in Industrial Design prepares creative individuals to design objects used by people on a daily basis. The industrial design profession serves the needs of consumers and manufacturers by developing products that are attractive, useful, safe, convenient, and comfortable to use. The designer's special talents and skills include a sense of the aesthetic, knowledge of materials and processes, and an understanding of the physical and psychological needs of the user. Designers often serve as a catalyst among management, marketing, and engineering.

By way of studio projects, students learn to visualize ideas, to communicate them to others, and to refine their skills in freehand sketching, computer-aided design, and model making. Assignments are a balance of conceptual aspects and practical techniques. Typical projects include electronics, toys, furniture, sports equipment, and packaging. Focus is placed on the role of the designer as a member of a team. Third-year students perform internships in a large corporation or in a consulting design agency.

Interior Design. The program in Interior Design is accredited by the Foundation for Interior Design Education Research, the national accrediting agency. The five-year curriculum emphasizes design process, technical skill development, problem solving, and the management skills needed to work in collaboration with the allied design professions. The goal of interior design is to create high-quality environments for human use.

Significant changes in the interior design profession over the last two decades are reflected in the program. The school is committed to integrating computer technology into each level of the curriculum. In doing so, the program offers an excellent environment for experimenting with and testing innovative applications of computer-aided design and simulation to interior design.

ADMISSION

Lower-Division Program. New and transfer students who have been admitted to the university and who have selected Graphic Design, Industrial Design, or Interior Design as a major are admitted to the appropriate lower-division program. Transfer credits for the lower-division program are reviewed by the college and evaluated for applicability to this curriculum. To be applicable, transfer courses must be

equivalent in both content and level of offering. A review of samples of work is required for studio classes; consult a college academic advisor.

Lower-division students entering the program who are not prepared for certain courses in the curriculum (for example, algebra and trigonometry or a second course in computer programming) are required to take additional courses that do not apply to the Bachelor of Science in Design degree. If such courses are required, an additional year of study may be necessary to complete the lower-division program.

Completion of lower-division requirements does not ensure acceptance to an upper-division professional program.

Upper-Division Program. When students have completed the lower-division curriculum requirements, they may apply for acceptance to upper-division programs in Graphic Design, Industrial Design, or Interior Design. The limited spaces available each year are awarded to applicants with the highest promise for professional success, as determined by each program. The faculty of the School of Design retain the right to admit any meritorious student who may be deficient in a published school criterion. Such admission requires an extraordinary review of the applicant by the school's admissions committee. Should the faculty choose to admit such an applicant, the student is placed automatically on a provisional admission status with stipulations as to what is required to be removed from probation. See "Application to Upper-Division Programs," on this page.

Students not admitted to upper-division programs are not dismissed from the university and may reapply or transfer to other programs. Students who intend to reapply should meet with a college academic advisor.

GRADUATE PROGRAMS

The School of Design offers a Master of Science in Design degree with concentrations in graphic design, industrial design, and interior design. The faculty also participates in a collegewide, interdisciplinary Ph.D. degree in Environmental Design and Planning with concentrations in design; history, theory, and criticism; and planning. For more information, see the *Graduate Catalog*.

APPLICATION TO UPPER-DIVISION PROGRAMS

Upper-Division Application Procedures. Students should write to a college academic advisor for the application form well in advance of the application deadline. For more information on portfolios, ask for a copy of the *Portfolio Seminar* brochure from a college academic advisor. The following dates and procedures are for students applying to 2002–2003 upper-division programs.

Upper-Division Application Deadlines. The following dates and procedures apply to Industrial and Interior Design portfolio submission only. Information regarding portfolio submission for Graphic Design is listed separately.

April 15, 2002. Portfolio and application documents are due in the school office by 5 P.M.

June 3, 2002. If the spring 2002 semester includes transfer course work (i.e., course work taken at an institution other than ASU), a student must submit his or her transcripts to the school no later than June 3. These transcripts may be unofficial copies. A second set of official transcripts must be sent to the university Undergraduate Admissions office. Application is not complete until the university receives official transcripts for transfer course work. For those transfer students whose academic term ends in June rather than May, this deadline may be extended upon the written request of the applicant.

July 1, 2002. Acceptance notices are mailed no later than July 1.

March 15, 2002. The application deadline for Graphic Design is March 15, 2002. In addition to the portfolio submission, Graphic Design requires an aptitude test, which is part of the application packet. Application packets can be obtained from the Academic Advising Office one month before the due date. Students may obtain their application results by contacting the academic coordinator for Graphic Design at the end of the first week of April. Acceptance notices are mailed to admitted students.

Return of Letter of Acceptance. A signed receipt of acceptance of admission must be received by the school by the date indicated on the Notice of Acceptance. Alternates may be accepted at a later date if space becomes available.

Matriculation. An accepted student is expected to begin his or her upper-division professional program at the beginning of the immediate fall term. There is no spring admission to the upper division.

Graphic Design Application Requirements. Individual applicants are responsible for obtaining the Graphic Design Application Packet by visiting the College of Architecture and Environmental Design Academic Advising Office in ARCH 141. Application materials are submitted in a portfolio organized by the individual applicant. The student's name must be affixed to the outside, with completed materials appearing in the following order:

1. application to the Graphic Design upper-division program;
2. "Commonly Asked Questions" form; and
3. the Graphic Design Aptitude Test.

The packet contains complete instructions for completing the standard test. This test requires the completion of five problems that are reviewed by the faculty and that become the portfolio of materials considered for admission to the upper-division program.

Industrial and Interior Design Portfolio Format

Requirements. Each applicant is responsible for obtaining the following documents and including them in the portfolio. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8.5" x 11" format only). The student's name must be affixed to the outside. Items must appear in the following order:

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Page 1. The application form should be completely filled out with the first page visible. Application forms are available from the college Academic Advising Office.

Page 2. The second page of the application should be visible.

Page 3. Application Essay or Letter of Intent.

Page 4. All college transcripts for both ASU and transfer work should be included through the fall 2001 semester. Copies are acceptable. An academic advisor forwards 2002 ASU transcripts. (Applicants wishing to transfer spring semester 2002 work are responsible for submitting these transcripts by June 3 so that they may be added to their portfolios. The student is also responsible for getting an official transfer transcript sent directly to the Office of the Registrar.)

Page 5. A certificate of admission to ASU is necessary only for those students who have been newly admitted for fall 2001 and who are applying directly into an upper-division program. The certificate is not required for students currently attending ASU.

Following Pages (Usually from 10 to 20 Sheets). Students should present work sufficient to demonstrate the depth and breadth of their creative activity. This work should include (but is not limited to) examples of two- and three-dimensional design and graphics. Each project should be clearly identified (course, length of project, etc.), with a concise accompanying description of the assignment.

Students should obtain a portfolio requirements addendum for their major from the college's Academic Advising Office, ARCH 141, at the beginning of the academic year in which they intend to apply to the upper-division program. Requirements or instructions indicated in the addendum for that academic year take precedence over any other printed material.

Students are encouraged to include additional materials, written or pictorial, that provide further evidence of skills and abilities and of the aptitude and commitment to the major. When any work submitted is not completely original, the source must be given. When work is of a team nature, the applicant's role should be clearly indicated. Original examples or slides must not be submitted. All examples must be photographs or other reproduction graphic media.

Return of Portfolios. Application documents (pages 1–5) remain the property of the College of Architecture and Environmental Design. However, the remainder of the portfolio is returned after the admissions review, provided the applicant encloses a self-addressed return mailer with sufficient prepaid postage. Portfolios may be claimed in person after July 2, 2001. If the applicant provides written permission, another person may claim the portfolio. After one year, unclaimed portfolios are discarded. While care is taken in handling the portfolios, no liability for lost or damaged materials is assumed by the college or school.

ADVISING

Advising for the lower- and upper-division curricula is through a college academic advisor (ARCH 141).

DEGREE REQUIREMENTS

The Bachelor of Science in Design degree requires a minimum of 120 semester hours for a major in Graphic Design

and Industrial Design and a minimum of 150 semester hours for a major in Interior Design. The program includes required field trips. Students are responsible for these additional costs. Foreign study opportunities are available for students. An internship is a required part of the program.

Graphic Design

The curriculum in Graphic Design is divided into a pre-professional (first year) and a professional program (second, third, and fourth years):

Preprofessional program	30
Professional program	90
Total	120

The lower-division curriculum balances a foundation in academic subjects such as English, numeracy, and computer technology with design courses that include history and theory, as well as studio courses in drawing and design fundamentals as they relate to conceptual design. Students apply for entry into the professional program after fulfilling the first year School of Design core foundation courses. The upper-division curriculum includes studio work in graphic design and its relationship to problem solving at multiple scales. Projects are intended to educate students to think critically as individuals and as team participants in small and large corporate facilities. A formal eight-week summer internship is required in the professional program. The internship is coordinated by the faculty. Students intern in a variety of settings, including in-house corporate design, publication design, and advertising design agencies.

General Studies Requirement. The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See "General Studies," page 78, for requirements and a list of approved courses. Note that all three General Studies awareness areas are required. Consult an advisor for an approved list of courses.

Graduation Requirements. In addition to fulfilling college and major requirements for this professional degree, students must meet all university graduation and college degree requirements. See "University Graduation Requirements," page 74, and "College Degree Requirements," page 118.

Graphic Design—B.S.D. Preprofessional Program Requirements¹

First Year

Fall

DSC 101 Design Awareness <i>HU, G</i>	3
DSC 121 Design Principles I ¹	3
ENG 101 First-Year Composition	3
or ENG 105 Advanced First-Year Composition (3) if qualified	
MA elective	3
CS elective	3
Total	15

Spring

DSC 120 Design Drawing ¹	3
DSC 122 Design Principles II ¹	3
ENG 102 First-Year Composition	3

Approved elective ²	3
SB elective	3
Total	15
Preprofessional program total	30

¹ Transfer credits for the lower-division program must be equivalent in both content and level of offering. Samples of studio work to be accepted for credit must be submitted for evaluation through the college's Academic Advising Office, ARCH 141.

² A list of courses that fulfill approved electives is available from the college academic advisor.

**Graphic Design—B.S.D.
Professional Program Requirements**

Second Year

Fall

DSC 494 ST: Finding Purpose: Survival in Design.....	3
GRA 283 Letterform I ¹	3
GRA 284 Visual Communication I ¹	3
L elective ²	3
SB elective ²	3
Total	15

Spring

GRA 286 Visual Communication II ¹	3
GRA 287 Letterform II ¹	3
Design elective ²	3
HU, H elective ²	3
SQ, SG elective with laboratory I.....	4
Total	16

Third Year

Fall

GRA 345 Design Rhetoric L ¹	3
GRA 383 Typography I ¹	3
GRA 386 Visual Communication III ¹	3
Approved electives ²	6
Total	15

Spring

DSC 483 Preinternship Seminar ¹	1
GRA 318 History of Graphic Design HU.....	3
GRA 385 Typography II ¹	3
GRA 387 Visual Communication IV ¹	3
C elective ²	3
Upper-division design elective ²	3
Total	16

Summer

DSC 484 Internship ¹	3
Total	3

Fourth Year

Fall

GRA 481 Visual Communication V ¹	3
GRA 494 ST: Graphic Design.....	3
SQ, SG elective with laboratory II.....	4
Upper-division design elective ²	3
Total	13

Spring

GRA 482 Visual Communication VI ¹	3
GRA 494 ST: Graphic Design.....	3

Approved elective ²	3
Upper-division approved elective ²	3
Total	12
Professional program total	90
B.S.D. minimum total	120

¹ Most studio courses and some lecture courses are sequential. They must be taken in, and may be offered only during, the semester noted.

² A list of courses that fulfill approved electives is available from the college academic advisor.

Industrial Design

The curriculum in Industrial Design is divided into a pre-professional (first and second years) and a professional program (third and fourth years):

Preprofessional program	61
Professional program	59
Total	120

The preprofessional curriculum balances a foundation in academic subjects such as English, algebra and trigonometry, computing, and physics with departmental courses that include history as well as studio courses in drawing, design fundamentals, human factors, and materials and processes.

The professional curriculum includes studio and laboratory work in industrial design, graphics, project development, and professional practice. Students also take a number of approved program electives. A supervised summer internship is part of the curriculum.

Upper-division studios emphasize projects that promote an interdisciplinary approach to solving problems and that develop the student's intellectual understanding of the philosophy, methodology, and theories related to industrial design. Problems proceed from small consumer products with simple task functions to larger and more complex problems and systems. Studio projects also emphasize the design processes: problem resolution through concept ideation, dialogue with specialists in related areas, and product development, presentation, and marketing.

Graduates of the program accept positions in industry and with firms involved in industrial design. Designers may focus on consumer products, transportation, electronics, medical devices, health products, or recreational products, among others. Designers may also choose to continue their education with graduate studies to enrich their design knowledge, to specialize, or to prepare for college-level teaching.

General Studies Requirement. The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See "General Studies," page 78, for requirements and a list of approved courses. Note that all three General Studies awareness areas are required. Consult an advisor for an approved list of courses.

Graduation Requirements. In addition to fulfilling college and major requirements, students must meet all university graduation and college degree requirements. See "University Graduation Requirements," page 74, and "College Degree Requirements," page 118.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

**Industrial Design—B.S.D.
Preprofessional Program Requirements¹**

First Year

Fall

DSC 101	Design Awareness <i>HU, G</i>	3
DSC 121	Design Principles I ¹	3
ENG 101	First-Year Composition.....	3
	or ENG 105 Advanced First-Year Composition (3) if qualified	
MAT 170	Precalculus <i>MA</i>	3
PGS 101	Introduction to Psychology <i>SB</i> ²	3
Total	.....	15

Spring

DSC 120	Design Drawing ¹	3
DSC 122	Design Principles II ¹	3
ECN 112	Microeconomic Principles <i>SB</i> ²	3
ENG 102	First-Year Composition.....	3
PHY 111	General Physics <i>SQ</i> ³	3
PHY 113	General Physics Laboratory <i>SQ</i> ³	1
Total	.....	16

Second Year

Fall

DSC 236	Introduction to Computer Modeling <i>CS</i>	3
IND 227	Visual Methods for Problem Solving.....	3
IND 242	Materials and Design.....	3
IND 260	Industrial Design I.....	3
IND 316	20th-Century Design I <i>HU, H</i>	3
Total	.....	15

Spring

COM 225	Public Speaking <i>L</i>	3
	or approved program elective (3)	
IND 228	Imaging and Visualization.....	3
IND 243	Process and Design.....	3
IND 261	Industrial Design II.....	3
IND 317	20th-Century Design II <i>HU, H</i>	3
Total	.....	15
Preprofessional program total	.....	61

¹ Transfer credits for the lower-division program must be equivalent in both content and level of offering. Samples of studio work must be provided for evaluation. See a college academic advisor for an appointment.

² TGECC satisfied.

³ Both PHY 111 and 113 must be taken to secure SQ credit.

**Industrial Design—B.S.D.
Professional Program Requirements**

Third Year

Fall

DSC 344	Human Factors in Design.....	3
IND 327	Presentation Graphics.....	3
IND 354	Principles of Product Design.....	3
IND 360	Industrial Design III.....	5
Total	.....	14

Spring

IND 328	Graphics for Industrial Design.....	3
IND 361	Industrial Design IV.....	5
MKT 300	Principles of Marketing.....	3
SQ, SG	elective with approved laboratory.....	4
Total	.....	15

Summer

DSC 484	Internship.....	2
Total	.....	2

Fourth Year

Fall

ENG 301	Writing for the Professions <i>L</i>	3
IND 460	Design Project I.....	5
IND 470	Professional Practice for Industrial Design <i>L</i>	3
	Approved HU, SB elective.....	3
Total	.....	14

Spring

IND 461	Design Project II.....	5
IND 474	Design Seminar.....	3
C elective*	.....	3
Elective.....	.....	3
Total	.....	14
Professional program total	.....	59
B.S.D. minimum total	.....	120

* A list of courses that fulfill approved program electives is available from the college academic advisor.

Interior Design

The curriculum in Interior Design is divided into a pre-professional program (first and second year) and a professional program (third, fourth, and fifth years):

Preprofessional program	.....	56
Professional program	.....	94
Total	.....	150

The preprofessional curriculum balances a foundation in academic subjects such as English, algebra and trigonometry, computer technology, and physics with departmental courses that include history and theory, as well as studio courses in drawing, design fundamentals, and conceptual design.

The professional curriculum includes studio work in interior design, furniture design, construction methods/structures, codes as related to materials and finishes, human factors, environmental control systems, as well as lecture courses in the history of interior design, decorative arts, and textiles. An eight-week supervised summer internship is part of the curriculum. The fifth year is an interdisciplinary year in which students address real-life environmental problems. This final year is a capstone experience that utilizes all previous learning within and outside the professional program. The student's final design project is completed in consultation with a member of the local professional community.

Graduates from the program accept entry-level professional positions in a variety of settings, including interior design firms, departments of space planning, architectural firms, public institutions, and industry. Students may also choose to continue their education through graduate studies, which offer greater enrichment in studio disciplines and which contribute to the possibility for postsecondary-level academic appointments, giving the recipients highly sought-after academic credentials.

General Studies Requirement. The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See "General Studies," page 78, for requirements and a list of approved courses. Note that all

three General Studies awareness areas are required. Consult with your advisor for an approved list of courses.

Graduation Requirements. In addition to fulfilling college and major requirements, students must meet all university graduation and college degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 118.

**Interior Design—B.S.D.
Preprofessional Program Requirements¹**

First Year

Fall

DSC 101	Design Awareness <i>HU, G</i>	3
DSC 121	Design Principles I ¹	3
ENG 101	First-Year Composition.....	3
	or ENG 105 Advanced First-Year Composition (3) if qualified	
MAT 170	Precalculus <i>MA</i>	3
SB, C	elective.....	3
Total		15

Spring

ARS 102	Art of the Western World II <i>HU, H</i>	3
DSC 120	Design Drawing ¹	3
DSC 122	Design Principles II ¹	3
ENG 102	First-Year Composition.....	3
	or HU elective if ENG 105 is taken (3)	
PHY 111	General Physics <i>SQ</i> ²	3
PHY 113	General Physics Laboratory <i>SQ</i> ²	1
Total		16

Second Year

Fall

DSC 236	Introduction to Computer Modeling <i>CS</i>	3
INT 194	ST: Drafting for Interior Design ¹	3
INT 223	Interior Design Issues and Theories <i>HU</i> ¹	3
INT 235	User Needs and Behavior in Interior Design ¹	3
Total		12

Spring

COM 225	Public Speaking <i>L</i>	3
	or approved L elective (3)	
INT 220	Media for Design Development ¹	3
INT 231	Concepts for Interior Design ¹	3
SQ or SG	elective with laboratory.....	4
Total		13
Preprofessional program total		56

¹ Transfer credits for the lower-division program must be equivalent in both content and level of offering. Samples of studio work must be provided for evaluation. See a college academic advisor for an appointment.

² Both PHY 111 and 113 must be taken to secure SQ credit.

**Interior Design—B.S.D.
Professional Program Requirements**

Third Year

Fall

DSC 344	Human Factors in Design.....	3
INT 310	History of Interior Design I <i>HU, H</i>	3
INT 340	Interior Codes: Public Welfare and Safety.....	3
INT 364	Interior Design Studio I.....	5

INT 366	Construction Methods in Interior Design	3
Total		17

Spring

DSC 483	Preinternship Seminar.....	1
INT 311	History of Interior Design II <i>HU, H</i>	3
INT 341	Interior Materials and Finishes	3
INT 365	Interior Design Studio II.....	5
INT 455	Environmental Control Systems	3
Total		15

Summer

DSC 484	Internship	3
Total		3

Fourth Year

Fall

ENG 301	Writing for the Professions <i>L</i>	3
INT 412	History of Decorative Arts in Interiors <i>HU</i>	3
INT 442	Specifications and Documents for Interiors <i>L</i>	3
INT 457	Acoustics for Interior Design.....	3
INT 464	Interior Design Studio III.....	5
Total		17

Spring

INT 413	History of Textiles in Interior Design	3
INT 458	Lighting for Interior Design.....	3
INT 465	Interior Design Studio IV.....	5
SB	elective	3
Total		14

Fifth Year*

Fall

INT 422	Facilities Planning and Management I.....	3
INT 446	Furniture Design and Production	3
INT 466	Interior Design Studio V.....	5
Approved degree project elective.....		3
Total		14

Spring

INT 423	Facilities Planning and Management II	3
INT 467	Interior Design Studio VI.....	5
INT 472	Professional Practice for Interior Design	3
Approved degree project elective.....		3
Total		14
Professional program total		94
B.S.D. minimum total		150

* See “Fifth Year,” on this page.

Fifth Year. During the fifth year, the student concentrates on research and application of that research related to the development of a comprehensive project. This year is self-directed in nature and prepares the student for independent thinking and creative problem solving. The fifth-year experience promotes high expectations for producing professional work that represents the culmination of the major’s academic experience. It should be noted that the fifth-year studio sequence is designed to draw majors from the upper-division programs of industrial design, graphic design, and architecture, thus furthering a real-life interdisciplinary problem-solving experience.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

MINOR

Interior Design History

The minor in Interior Design History is available to students interested in design and culture. The courses designated for the minor are part of the professional studies in interior design within the School of Design. Moreover, the courses serve to inform the students about the importance of the global community, especially sociocultural groups, and the impact of the global community on the design of the interior environment.

The selected courses satisfy the minimum requirement (18 semester hours) for the minor. To enhance the understanding of the subject matter, the selected courses are sequential in nature and require certain prerequisites. Consequently, students should carefully note the semester in which any of these courses is offered. The only exception to this rule is INT 223.

Required Courses

DSC 101	Design Awareness	HU, G	.....3
INT 223	Interior Design Issues and Theories	HU	.....3
INT 310	History of Interior Design I	HU, H	.....3
INT 311	History of Interior Design II	HU, H	.....3
INT 412	History of Decorative Arts in Interiors	HU	.....3
INT 413	History of Textiles in Interior Design		.....3
Total			.....18

The minor in Interior Design History is open to students majoring in Architectural Studies, Art, Communication, Psychology, or Sociology and students in any College of Business major or the Bachelor of Interdisciplinary Studies program. All other majors are considered on an individual basis and approved by the coordinators of the Interior Design program within the School of Design. To pursue the minor in Interior Design History, students must have a minimum cumulative GPA of 2.50.

DESIGN (DSC)

DSC 100 Introduction to Environmental Design. (3)

fall and spring

Survey of environmental design: includes historic examples and the theoretical, social, technical, and environmental forces that shape them. Cross-listed as APH 100/PUP 100. Credit is allowed for only APH 100 or DSC 100 or PUP 100.

General Studies: HU, G, H

DSC 101 Design Awareness. (3)

fall

Survey of cultural, global, and historical context for the design professions.

General Studies: HU, G

DSC 120 Design Drawing. (3)

spring

Drawing as language to explore and communicate ideas. Development of drawing aptitude as language and process for design thinking. 1 hour lecture, 5 hours studio.

DSC 121 Design Principles I. (3)

fall

Design as a language and process for creative thinking and realization. 1 hour lecture, 5 hours studio. Prerequisite: major in the College of Architecture and Environmental Design.

DSC 122 Design Principles II. (3)

spring

Continued exploration of design as a language and process for creative thinking and realization. 1 hour lecture, 5 hours studio. Prerequisite: DSC 121.

DSC 236 Introduction to Computer Modeling. (3)

fall and spring

Computers in design, including software concepts, specific packages, and problem solving, illustration, typography, modeling, and animation. Lab. Prerequisite: Design major.

General Studies: CS

DSC 344 Human Factors in Design. (3)

fall

Man-machine environment systems; human characteristics and behavior applied to design of products, systems, and their operating environment.

DSC 483 Preinternship Seminar. (1)

spring

Preparation of internship materials that produce and enhance a successful internship experience. Seminar. Prerequisite: 3rd-year major in the School of Design.

DSC 484 Internship. (1–3)

summer

Full-time summer internship under supervision of practitioners in the Phoenix area or other locales. Prerequisite: instructor approval.

DSC 494 Special Topics. (1–4)

fall

Possible topics:

(a) Finding Purpose: Survival in Design. (3)

DSC 500 Research Methods. (1–12)

not regularly offered

Fee.

DSC 520 Contemporary Design Issues. (3)

fall and spring

Projected applications in design production, planning, and decision-making processes. Lecture, seminar. Prerequisites: INT 310 and 311 (or their equivalents).

DSC 524 Illumination and Acoustics. (3)

not regularly offered

Research and laboratory investigation of advanced illumination and acoustics issues of facility design. Emphasis on human factors and performance aspects. Prerequisites: INT 457 and 458 (or their equivalents).

DSC 525 Design Methodologies. (3)

fall

Practical exercises and studies in problem-solving strategies; problem definition and supporting theory for the designer. Lecture, seminar, lab. Fee. Prerequisite: senior or graduate standing.

DSC 527 Modern Design Theory. (3)

spring

Aesthetic, political, economic, and social theories that have shaped modern design; theory as the basis for design philosophies. Lecture, seminar. Prerequisite: DSC 525 (or its equivalent).

DSC 529 Design Criticism. (3)

fall

Critical methods applied to design as material culture and human expression; evaluation of achievement versus intention. Lecture, seminar. Prerequisite: DSC 527 (or its equivalent).

DSC 544 Human Factors Systems and Documentation. (3)

fall

Advanced topics associated with theory and methods of human factors in design. Individual projects stressing problem organization, evaluation, and documentation. Lecture, seminar, lab. Prerequisite: DSC 344 (or its equivalent).

DSC 552 Computer Simulation in Design. (3)

fall

Use of computer graphics as a medium to develop and present images of the environment for analysis and perception. Lecture, lab. Prerequisite: senior or graduate standing.

DSC 553 Computer Imaging and Visual Perception. (3)

spring

Issues and applications of computer simulation as a tool for describing and testing human interface with the environment. Lecture, lab. Prerequisite: senior or graduate standing.

DSC 558 Daylighting. (3)

not regularly offered

Daylighting as a design determinant; concepts, techniques, methodology, experiments, and case studies. Lecture, studio. Prerequisite: senior or graduate standing.

DSC 580 Practicum: Methods of Teaching Design. (3)*fall*

Background and development of design education theories. Concepts of studio teaching methods. Comprehensive student project development and evaluation methods. Prerequisite: graduate standing.

DSC 593 Applied Project. (1–12)*not regularly offered*

Fee.

DSC 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Facilities Planning II
Fee.

DSC 599 Thesis. (1–12)*not regularly offered*

Fee.

GRAPHIC DESIGN (GRA)**GRA 283 Letterform I. (3)***fall*

Drawing of letterforms with focus on proportion and structure. Introduction to letterform nomenclature and classifications. 6 hours a week. Fee. Prerequisites: DSC 122; acceptance into Graphic Design program.

GRA 284 Visual Communication I. (3)*fall*

Theoretical and applied studies in shape, drawing, and color. 6 hours a week. Fee. Prerequisite: GRA 283.

GRA 286 Visual Communication II. (3)*spring*

Transition from theoretical to applied problems. Emphasis on refinement of visual skills. 6 hours a week. Fee. Prerequisites: GRA 284; acceptance into Graphic Design program. Corequisite: GRA 287.

GRA 287 Letterform II. (3)*spring*

Continuation of GRA 283 with emphasis on lowercase letters; basics of pen writing and font design. 6 hours per week. Fee. Prerequisites: GRA 284; acceptance into Graphic Design program. Corequisite: GRA 286.

GRA 318 History of Graphic Design. (3)*spring*

Surveys development in the graphic arts, innovative printing methods, aesthetic values, and social and cultural environments that shape them.

*General Studies: HU***GRA 345 Design Rhetoric. (3)***fall*

Develops critical thinking and expression of ideas in concise and persuasive written and spoken form. Prerequisites: ENG 101, 102.

*General Studies: L***GRA 382 Graphic Representation. (3)***fall*

Studio practice in drawing with an application toward graphic communication. 6 hours a week. May be repeated once for credit. Fee. Prerequisite: GRA 284.

GRA 383 Typography I. (3)*fall*

Theoretical exercises in spatial and textural qualities of type. Problems in tension, activation, and balance. Exercises in simple typographical applications. 6 hours a week. Fee. Prerequisites: GRA 286, 287. Corequisite: GRA 386.

GRA 385 Typography II. (3)*spring*

Problems in composition, choice, and combinations of typefaces, formats, and their application to a variety of design projects. 6 hours a week. Fee. Prerequisite: GRA 383. Corequisite: GRA 387.

GRA 386 Visual Communication III. (3)*fall*

Problems in specific design applications such as poster, packaging, publications. Emphasis on development of concepts in visual communications. 6 hours a week. Fee. Prerequisites: GRA 286, 287. Corequisite: GRA 383.

GRA 387 Visual Communication IV. (3)*spring*

Client-oriented projects. Multifaceted problems with emphases on continuity of design in more than one medium and format. 6 hours a week. Fee. Prerequisites: GRA 383, 386. Corequisite: GRA 385.

GRA 481 Visual Communication V. (3)*fall*

Studio problems with emphasis on analysis, problem solving, and professional portfolio preparation. 6 hours a week. Fee. Prerequisites: GRA 385, 387.

GRA 482 Visual Communication VI. (3)*spring*

Individual and group projects with outside clients. All projects culminate in an exhibit. 6 hours a week. Fee. Prerequisite: GRA 481.

GRA 485 Graphic Design Workshop. (3)*fall, spring, summer*

Preprofessional client/designer situations from concept to printed work. Studio workshop and internships for selected students. 6 hours a week. May be repeated once for credit. Fee. Prerequisite: instructor approval.

GRA 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Graphic Design. (3)

INDUSTRIAL DESIGN (IND)**IND 194 Special Topics. (1–4)***spring*

Possible topics:

- (a) Drafting for Industrial Design. (3)
Applies mechanical drafting knowledge and skills. Manual drafting principles and techniques with transition to computer-aided industrial design.

IND 227 Visual Methods for Problem Solving. (3)*fall*

Introduction to conceptual design activity based on the mind-eye-media feedback loop. Graphic language used to represent conjecture, analysis, synthesis of objects, and their contexts. Seminar, studio. Prerequisite: DSC 122.

IND 228 Imaging and Visualization. (3)*spring*

Design activities stressing graphic language abstraction practiced for presentation. Discusses structure of criticism, including description, interpretation, and evaluation. Seminar, studio. Prerequisite: IND 227.

IND 242 Materials and Design. (3)*fall*

Materials application in design. Introduction to characteristics and properties of metals and organic materials, including plastics, and inorganic materials.

IND 243 Process and Design. (3)*spring*

Influences of industrial processing on design. Introduction to basic materials processing and post-forming processes. Emphasis on appearance enhancement and design constraints of material processing. Prerequisite: IND 242.

IND 260 Industrial Design I. (3)*fall*

Introduction to the method and process of the industrial designer. Determinants necessary in small product design. 1 hour lecture, 2 hours studio. Prerequisite: DSC 122.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

IND 261 Industrial Design II. (3)*spring*

Issues of physical form development related to product and design; form development properties of paper, fibers, wood, metal, and plastics. 1 hour lecture, 2 hours studio. Prerequisite: IND 260 (or its equivalent).

IND 316 20th-Century Design I. (3)*fall*

Modern European and American design from 1900 to 1940. Emphasis on transportation, product, furniture, exhibition, and graphic design.

*General Studies: HU, H***IND 317 20th-Century Design II. (3)***spring*

Modern European, Asian, and American design since 1940. Emphasis on transportation, product, furniture, exhibition, and graphic design.

*General Studies: HU, H***IND 327 Presentation Graphics. (3)***fall*

Studies methods for portfolio and professional product presentation using graphic media for information transfer. Stresses aesthetic judgment, organization, and craftsmanship. Seminar, studio. Prerequisite: IND 228.

IND 328 Graphics for Industrial Design. (3)*spring*

Investigates and applies packaging applications and planning to the development of an identity for a product line structured as a system. Lab. Prerequisite: IND 327.

IND 354 Principles of Product Design. (3)*fall*

Influences of physical and mechanical concepts in product design; mechanisms, kinematics, and fastening systems. Concepts of analysis for product design. Influences of concepts on aesthetics. Prerequisite: PHY 111.

IND 355 Plastics Design. (3)*spring*

Mold design for part requirements; molded holes; threads; inserts; fastening and joining; decorating; reinforced plastics.

IND 360 Industrial Design III. (5)*fall*

Methods of visual thinking, conceptualization, and ideation related to building skill levels in professional design presentation techniques. 10 hours studio. Fee. Prerequisite: school approval.

IND 361 Industrial Design IV. (5)*spring*

Emphasis on developing ideas into a complete functional product, including survey and application of aesthetics, human factors, materials, and manufacturing. 10 hours studio. Fee. Prerequisite: IND 360.

IND 460 Design Project I. (5)*fall*

Complete analysis of the product unit as an element of mass production, featuring marketing, technology, human factors, and visual design. Emphasis on professional standards. 10 hours studio. Fee. Prerequisites: DSC 484; IND 361.

IND 461 Design Project II. (5)*spring*

Product design, with emphasis in systems interaction. Culmination of design process and technique. Encourages individual project direction. 10 hours studio. Fee. Prerequisite: IND 361.

IND 470 Professional Practice for Industrial Design. (3)*fall*

Business procedures, management techniques, accounting systems, ethics, and legal responsibilities of the design professions. May be repeated for credit. Prerequisite: senior standing.

*General Studies: L***IND 474 Design Seminar. (3)***spring*

Manufacturer's liability, statutes, regulations, and common law rules; role of expert witnesses; insurance and product safety programs. Seminar. Prerequisite: senior standing.

IND 494 Special Topics. (3)*not regularly offered*

Applies mechanical drafting knowledge and skills. Manual drafting principles and techniques with transition to computer-aided industrial design.

INTERIOR DESIGN (INT)**INT 194 Special Topics. (1-4)***fall*

Possible topics:

(a) Drafting for Interior Design. (3)

INT 220 Media for Design Development. (3)*spring*

Graphic representation methods used to describe and analyze space; emphasis on quick presentation techniques. 6 hours studio. Prerequisite: DSC 122.

INT 223 Interior Design Issues and Theories. (3)*fall*

Interiors issues, theories, and philosophies. Emphasis on unique social and cultural factors that shape 20th-century design concepts.

*General Studies: HU***INT 231 Concepts for Interior Design. (3)***spring*

Conceptual design development, including scale and proportion, light, texture, form, volume, and spatial hierarchy; passage and repose. 1 hour lecture, 4 hours lab. Prerequisite: DSC 236.

INT 235 User Needs and Behavior in Interior Design. (3)*fall*

Applies conceptual design to issues of programming and space planning, user needs, and behavior. 1 hour lecture, 4 hours lab. Prerequisite: DSC 122.

INT 310 History of Interior Design I. (3)*fall*

Design of interior spaces as an expression of cultural influences to 1835.

*General Studies: HU, H***INT 311 History of Interior Design II. (3)***spring*

Design of interiors as an expression of cultural influences from 1835 to the present. Prerequisite: INT 310 or instructor approval.

*General Studies: HU, H***INT 340 Interior Codes: Public Welfare and Safety. (3)***fall*

Codes and regulations as performance criteria for interior design. Corequisite: INT 366.

INT 341 Interior Materials and Finishes. (3)*spring*

General analysis of quality control measures relating to interior design materials, finishes, and performance criteria. Prerequisites: INT 340, 366.

INT 364 Interior Design Studio I. (5)*fall*

Studio problems in interior design related to behavioral response in personal and small group spaces. 10 hours studio. Fee. Prerequisite: school approval.

INT 365 Interior Design Studio II. (5)*spring*

Studio problems in interior design, with emphasis on issues of public and private use of interior places of assembly. 10 hours studio. Fee. Prerequisite: INT 364.

INT 366 Construction Methods in Interior Design. (3)*fall*

Design theory related to analysis, materials, and building techniques of horizontal and vertical construction in interior design. Lecture, field trips. Corequisite: INT 340.

INT 412 History of Decorative Arts in Interiors. (3)*fall*

Design of decorative arts as an expression of cultural influences and as an extension of interior spaces. Prerequisite: INT 311 or instructor approval.

*General Studies: HU***INT 413 History of Textiles in Interior Design. (3)***spring*

Cultural and historical expression of textiles as related to interiors. May include field trips. Prerequisite: INT 412 or instructor approval.

INT 422 Facilities Planning and Management I. (3)*fall*

Facility management process in large-scale organizations. Planning, long-range forecasting, and productivity. Project management methodologies using micro-based software programs. Prerequisite: senior standing.

INT 423 Facilities Planning and Management II. (3)*spring*

Formation of facilities policies, procedures, and standards. Facilities database, space allocations, and management process. Evaluation of programming criteria. Prerequisites: INT 422; senior standing.

INT 442 Specifications and Documents for Interiors. (3)*fall*

Contract specifications, documents, schedules, and bidding procedures for interior design. Prerequisites: INT 341, 365.

*General Studies: L***INT 446 Furniture Design and Production. (3)***fall*

Design, construction, cost estimating, and installation in interior furniture and millwork. 1 hour lecture, 4 hours studio.

INT 455 Environmental Control Systems. (3)*spring*

Survey of environmental control systems and their application in the design of building interiors. Lecture, field trips. Prerequisites: MAT 117, 170; PHY 111, 113; junior standing.

INT 457 Acoustics for Interior Design. (3)*fall*

Physical properties of sound. Studies pertaining to sound-absorbing materials, constructions, and room acoustics. Prerequisites: MAT 170; PHY 111, 113.

INT 458 Lighting for Interior Design. (3)*spring*

Light as an aspect of interior design. Evaluation of light sources for distribution, color, and cost.

INT 464 Interior Design Studio III. (5)*fall*

Studio problems in interior design related to commercial spaces. 10 hours studio. Fee. Prerequisites: DSC 484; INT 365.

INT 465 Interior Design Studio IV. (5)*spring*

Studio problems in interior design related to health and educational facilities. 10 hours studio. Fee. Prerequisite: INT 464.

INT 466 Interior Design Studio V. (5)*fall*

Advanced interior design problem solving, design theory, and criticism. Thesis project development based upon the major's concentration. 10 hours studio. Fee. Prerequisite: school approval.

INT 467 Interior Design Studio VI. (5)*spring*

Advanced series of specialized projects or continuation of thesis project based upon the major's concentration. 10 hours studio. Fee. Prerequisite: school approval.

INT 472 Professional Practice for Interior Design. (3)*spring*

Business procedures, project control, fee structures, and professional product liabilities.

School of Planning and Landscape Architecture

Frederick Steiner

Director

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CAMERON, COOK, GUHATHAKURTA, KIM, McSHERRY, SAN MARTIN, YABES

ASSISTANT PROFESSORS

CREWE, EWAN, FISH-EWAN, LARSEN, MUSACCHIO

FACULTY ASSOCIATE

DOLLIN

PURPOSE

The faculty in the School of Planning and Landscape Architecture offer curricula that provide an education for careers in environmental planning, housing and urban development, landscape architecture, urban and regional planning, and urban design. The goal of the faculty is to advance the professions of planning and landscape architecture through scholarship, teaching, research, and community service.

Planners and landscape architects work on projects that range in scale from site and landscape development to the design of entire communities and the formulation of policies that shape urban and regional growth. Planning and landscape architecture graduates work for private firms and government agencies. Their work typically involves fields such as land-use planning, housing, natural resource management, urban transportation, development controls, and environmental impact assessment.

ORGANIZATION

The programs are organized by the faculty of the school under the direction and administration of the program coordinators and the school director.

DEGREES

The faculty in the School of Planning and Landscape Architecture offer the Bachelor of Science in Planning degree in Urban Planning, Bachelor of Science in Landscape Architecture degree, and Bachelor of Science in Design degree in Housing and Urban Development.

Bachelor of Science in Planning (B.S.P.)

The B.S.P. degree prepares students for careers in urban planning. Students take courses that include comprehensive planning, socioeconomic and environmental analysis, computer and analytical methods, planning law, site planning,

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

landscape architecture, urban design, and public-policy formulation and administration. An internship or an approved elective is required between the third and fourth years. Many students continue to specialize in planning at the graduate level. Students in planning are exposed to the theories, methods, and practices of the profession of planning.

Bachelor of Science in Landscape Architecture (B.S.L.A.)

The B.S.L.A. prepares students to be professional landscape architects. Students explore the reasons for and the techniques involved in the analysis, planning, and design of the environment, both natural and built. The B.S.L.A. is an accredited program.

Bachelor of Science in Design (B.S.D.)

A B.S.D. degree with a major in Housing and Urban Development (HUD) educates and trains professionals to lead in the production of high-quality affordable housing, in the development of creatively designed and soundly planned neighborhoods and communities, in the revitalization of communities, and in the exemplification of social inclusiveness and environmental sensitivity in responsible land development. HUD graduates may pursue careers in the private home development industry, in publicly sponsored housing and community redevelopment, with nonprofit housing agencies, or in postgraduate housing and urban development research and education. The B.S.D. degree with a major in Housing and Urban Development is offered in conjunction with the College of Extended Education.

MINORS

Landscape Studies

For more information, call 480/965-7167.

Urban Planning

The minor in Urban Planning is designed for students who are interested in the field but who wish to pursue other majors. The course selection is designed to provide an overview of the field and offer information with broad appeal.

All students must complete a minimum of 15 semester hours from the following courses:

PUP 200	The Planned Environment <i>HU, H</i>	.....3
PUP 301	Introduction to Urban Planning <i>L*</i>3
PUP 412	History of the City <i>H</i>	.....3
PUP 420	Theory of Urban Design <i>HU</i>	.....3
PUP 425	Urban Housing Analysis	.....3
PUP 430	Transportation Planning and the Environment	.....3
PUP 432	Planning and Development Control Law	.....3
PUP 433	Zoning Ordinances, Subdivision Regulations, and Building Codes	.....3
PUP 442	Environmental Planning	.....3
PUP 444	Preservation Planning	.....3
PUP 475	Environmental Impact Assessment	.....3
PUP 494	Special Topics	.....3
PUP 510	Citizen Participation	.....3

* PUP 301 Introduction to Urban Planning is required. Landscape Architecture students must choose another class with an advisor's approval since PUP 301 is already required for the B.S.L.A.



Touring the ballroom during the restoration of Old Main

Tim Trumble photo

The minor is automatically open to students from the following majors: Architectural Studies, Civil Engineering, Environmental Resources, Geography, Housing and Urban Development, Landscape Architecture, and Real Estate. Students pursuing other majors will be considered on an individual basis. To pursue a minor in Urban Planning, students must have a minimum cumulative GPA of 3.00. These students must submit a letter of application to the School of Planning and Landscape Architecture seeking approval to enter the minor program.

GRADUATE PROGRAMS

The faculty in the School of Planning and Landscape Architecture offer concentrations in landscape ecological planning, urban and regional development, and urban design under the Master of Environmental Planning (M.E.P.) degree and a collegewide, interdisciplinary Ph.D. degree in Environmental Design and Planning with concentrations in design; history, theory, and criticism; and planning. For more information, see the *Graduate Catalog*.

ADMISSION

Lower-Division Program. New and transfer students who have been admitted to the university and who have selected a program in the School of Planning and Landscape Architecture are admitted to the lower-division program. Transfer credits for the lower-division program are reviewed by the college and evaluated for applicability to this curriculum. To be applicable, transfer courses must be equivalent in both content and level of offering. A review of samples of work is required for studio classes. See a college academic advisor for an appointment.

Completion of lower-division requirements does not ensure acceptance to the upper-division professional program. Admission to the upper division is competitive and limited to the space available. Admission requires formal application and acceptance.

Upper-Division Program. Admission to the upper-division programs of the School of Planning and Landscape Architecture is limited to applicants who have completed the lower-division program requirements and who are determined by the admissions committee to have the best potential for academic success. Spaces in the program are limited by available facilities, faculty, and qualified applicants. A minimum lower-division program GPA of 3.00 may be required. See "Application to Upper-Division Programs," on this page.

Students not admitted to upper-division programs are not dismissed from the university and may reapply later or may transfer to other programs. Students who plan to reapply should meet with a college academic advisor.

APPLICATION TO UPPER-DIVISION PROGRAMS

Upper-Division Application Procedures. Students should write to a college academic advisor for the application form well in advance of the application deadline. For more information on portfolios, ask for a copy of the portfolio guidelines from a college academic advisor. The following dates

and procedures are for students applying to 2002–2003 upper-division programs in Housing and Urban Development. Applicants to the upper-division programs in Landscape Architecture and Urban Planning follow different procedures and have different deadline dates; see an advisor in the advising office for more information.

Upper-Division Application Deadlines. *April 15, 2002.* Portfolio and application documents are due in the school office by 5 P.M.

June 3, 2002. If the spring 2002 semester includes transfer course work (i.e., course work taken at an institution other than ASU), a student must submit his or her transcripts to the school no later than June 3. These transcripts may be unofficial copies. A second set of official transcripts must be sent to the university Undergraduate Admissions office. Application is not complete until the university receives official transcripts for transfer course work. For those transfer students whose academic term ends in June rather than May, this deadline may be extended upon the written request of the applicant.

July 1, 2002. Acceptance notices are mailed no later than July 1.

Return of Letter of Acceptance. A signed receipt of acceptance of admission must be received by the school by the date indicated on the Notice of Acceptance. Alternates may be accepted at a later date if space becomes available.

Matriculation. An accepted student is expected to begin his or her upper-division professional program at the beginning of the immediate fall term. There is no spring admission to the upper division.

Portfolio Format Requirements. Each applicant is responsible for obtaining the following documents and including them in a presentation binder (portfolio) with plastic sleeves (8.5" x 11" format only) and a label, with the student's name, affixed to the outside:

1. evidence of graphic and design work shown in 35 mm slides or 3" x 5" or other appropriately sized photographs (20 maximum);
2. a statement of intent describing the applicant's specific background and interest in the major;
3. latest college-level transcript(s) (no high school transcripts are required);
4. one example of written work (e.g., a class paper); and
5. samples of individual work; team work can be included, but the contribution of the candidate must be clarified.

Students are also strongly encouraged to submit evidence of other endeavors related to the major. The applicant's GPA based on required courses and cumulative GPA is evaluated. Students completing the Phoenix Community College (PCC) articulation program with the B.S.D.-HUD program should submit similar material from PCC.

Students should obtain a portfolio requirements addendum for their major from the college's Academic Advising Office, ARCH 141, at the beginning of the academic year in

which they intend to apply to the upper-division program. Requirements or instructions indicated in the addendum for that academic year take precedence over any other printed material.

Return of Portfolios. Application documents remain the property of the School of Planning and Landscape Architecture. However, the remainder of the portfolio is returned after the admissions review, provided the applicant encloses a self-addressed return mailer with sufficient prepaid postage. Portfolios may be claimed in person after August 15, 2002. If the applicant provides written permission, another person may claim the portfolio. After one year, unclaimed portfolios are discarded. While care is taken in handling the portfolios, no liability for lost or damaged materials is assumed by the college or school.

ADVISING

Advising for the lower-division curriculum is provided through a college academic advisor. Advising for the upper-division curriculum is provided by the school director and faculty advisors.

DEGREE REQUIREMENTS

Urban Planning

The Bachelor of Science in Planning degree requires a total of 120 semester hours.

Preprofessional program courses	61
Professional program courses core	57
Internship	2
Total	120

General Studies Requirement. The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See “General Studies,” page 78, for requirements and a list of approved courses. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

Graduation Requirements. In addition to fulfilling college and major requirements, students must meet all university graduation and college degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 118.

**Bachelor of Science in Planning,
Major in Urban Planning
Preprofessional Program Requirements¹**

First Year

Fall	
ENG 101 First-Year Composition.....	3
or ENG 105 Advanced First-Year Composition (3) if qualified	
ERS 130 Introduction to Environmental Science <i>SQ</i>	4
or any <i>SQ</i> , <i>SG</i> elective	
MAT 117 College Algebra <i>MA</i>	3
or approved more advanced <i>MA</i> elective (3)	
PUP 100 Introduction to Environmental Design <i>HU</i> , <i>G</i> , <i>H</i>	3
PUP 161 Graphic Communication ²	3
Total	16

Spring

ECN 112 Microeconomic Principles <i>SB</i>	3
or economics elective <i>SB</i>	
ENG 102 First-Year Composition.....	3
<i>HU</i> elective if ENG 105 is taken (3)	
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or any <i>SQ</i> , <i>SG</i> elective	
C elective.....	3
Elective.....	3
Total	16

Second Year

Fall

PLA 101 Landscape and Society ² <i>HU</i> , <i>G</i>	3
or any <i>HU</i> or <i>SB</i> elective	
PUP 261 Urban Planning I ²	4
PUP 301 Introduction to Urban Planning <i>L</i>	3
Approved elective	3
<i>SB</i> elective	3
Total	16

Spring

PUP 262 Urban Planning II ²	4
PUP 322 Computers in Planning.....	3
PUP 363 History of Planning.....	3
Approved <i>HU</i> elective.....	3
Approved statistics elective or quantitative reasoning elective.....	3
Total	16
Preprofessional program total	64

¹ Transfer credits are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering.

² Portfolio review is required for transfer studio work. See a college academic advisor for an appointment.

The first round of admission to the upper division takes place after the fall semester of the second year. The second round, if needed, takes place after the spring semester.

**Bachelor of Science in Planning,
Major in Urban Planning
Professional Program Requirements**

Third Year

Fall

PUP 361 Urban Planning III.....	4
PUP 424 Planning Methods I.....	4
PUP 452 Ethics and Theory in Planning.....	3
Approved elective	3
Minimum total	14

Spring

PUP 362 Urban Planning IV.....	4
PUP 436 City Structure and Planning.....	3
PUP 510 Citizen Participation.....	3
Elective.....	3
Total	13

Summer

PUP 484 Internship or Study Abroad (use elective credit).....	3
or approved elective (3)	
Total	3

Fourth Year

Fall
 PUP 432 Planning and Development Control Law3
 PUP 442 Environmental Planning.....3
 PUP 461 Urban Planning V.....4
 Elective.....3
 Total13

Spring
 PUP 420 Theory of Urban Design *HU*.....3
 PUP 434 Urban Land Economics.....3
 or elective (3)
 PUP 462 Urban Planning VI4
 Elective.....3
 Total13

Select a minimum of nine semester hours from approved SPLA elective list.
 Professional program total56
 B.S.P. minimum total120

Landscape Architecture

The Bachelor of Science in Landscape Architecture degree requires a total of 120 semester hours.

Preprofessional program courses47
 Professional program courses73
 Total120

General Studies Requirement. The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See “General Studies,” page 78, for requirements and a list of approved courses. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

Graduation Requirements. In addition to fulfilling college and major requirements, students must meet all university graduation and college degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 118.

**Bachelor of Science in Landscape Architecture
 Preprofessional Requirements¹**

First Year

Fall
 ENG 101 First-Year Composition3
 or ENG 105 Advanced First-Year Composition (3)
 MAT 117 College Algebra *MA*3
 PLA 101 Landscape and Society *HU, G*3
 PLA 161 Graphic Communication²3
 PUP 100 Introduction to Environmental Design *HU, G, H*3
 Total15

Spring
 ADE 120 Design Fundamentals I²3
 ARS 101 Art of the Western World I *HU, H*3
 ENG 102 First-Year Composition3
 GPH 111 Introduction to Physical Geography *SQ*4
 HST 102 Western Civilization *SB, H*3
 Total16

Second Year

Fall
 PLA 240 Landscape Survey Techniques3
 PLA 261 Landscape Architecture I²4
 PLA 310 History of Landscape Architecture *H*3
 PLA 494 ST: Plant Materials.....3
 PUP 301 Introduction to Urban Planning *L*3
 Total16

Preprofessional program total47

¹ Transfer credits are reviewed by the college and evaluated as applicable to this curriculum. To be applicable, transfer courses must be equivalent in both content and level of offering.

² Portfolio review is required for transfer studio work. See a college academic advisor for an appointment.

**Bachelor of Science in Landscape Architecture
 Professional Program Requirements**

Second Year

Spring
 PLA 222 Computers in Landscape Architecture *CS*3
 PLA 242 Landscape Construction I4
 PLA 262 Landscape Architecture II4
 SQ or SG elective with laboratory4
 Total15

Third Year

Fall
 PLA 311 Contemporary Landscape Architecture.....3
 PLA 344 Landscape Construction II4
 PLA 361 Landscape Architecture III.....4
 C elective.....3
 Elective.....3
 Total17

Spring
 PLA 345 Professional Practice Seminar.....1
 PLA 362 Landscape Architecture IV4
 PLA 363 Landscape Planting Design4
 PUP 420 Theory of Urban Design *HU*3
 Electives3
 Minimum total15

Summer
 PLA 484 Internship (optional).....3
 or PLA 485 International Field Studies in Planning and Landscape Architecture (6) (optional)*

Fourth Year

Fall
 PLA 410 Social Factors in Landscape and Urban Planning.....3
 PLA 461 Landscape Architecture V4
 PUP 432 Planning and Development Control Law3
 Elective.....3
 Total13

Spring
 PLA 411 Landscape Architecture Theory and Criticism *L*3
 PLA 462 Landscape Architecture VI.....4

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Electives	6
Total	13
Professional program total	73
B.S.L.A. minimum total	120

* PLA 484 or 485 would be used as an elective in the fourth year.

Housing and Urban Development

The Bachelor of Science in Design degree in Housing and Urban Development requires a total of 120 semester hours.

Preprofessional program courses	63
Professional program courses core	56
Internship	1
Total	120

General Studies Requirements

The following curriculum includes sufficient approved course work to fulfill the General Studies requirement. See “General Studies,” page 78, for requirements and a list of approved courses. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

Graduation Requirements. In addition to fulfilling college and major requirements, students must meet all university graduation and college degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 118.

Bachelor of Science in Design, Major in Housing and Urban Development Preprofessional Program Requirements¹

First Year

Fall

ECN 112 Microeconomic Principles <i>SB</i>	3
ENG 101 First-Year Composition	3
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
HUD 161 Graphic Communication	3
PUP 100 Introduction to Environmental Design <i>HU, G, H</i>	3
Total	16

Spring

ECN 111 Macroeconomic Principles <i>SB</i>	3
or any <i>SB</i> elective (3)	3
ENG 102 First-Year Composition	3
HUD 201 Introduction to Housing and Urban Development	3
MAT 117 College Algebra <i>MA</i>	3
or MAT 170 Precalculus <i>MA</i> (3)	3
or MAT 210 Brief Calculus <i>MA</i> (3)	3
CS elective in computers	3
Total	15

Second Year

Fall

APH 200 Introduction to Architecture <i>HU, G</i>	3
or any CAED history course listed below (3) ²	3
CON 252 Building Construction Methods, Materials, and Equipment	3
PLA 261 Landscape Architecture I	4
or PUP 261 Urban Planning I (4)	4
C elective	3
CS statistics elective	3
Total	16

Spring

ACC 230 Uses of Accounting Information I	3
PUP 301 Introduction to Urban Planning <i>L</i>	3
Natural science with lab	4
REA elective	3
Upper-division <i>HU</i> elective	3
Total	16
Preprofessional program total	63

¹ Transfer credits are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering.

² See “CAED History Courses,” on this page.

CAED History Courses. These CAED history courses also fulfill *HU*. See the course listings for prerequisites.

APH 300 World Architecture I/Western Cultures <i>HU, G, H</i>	3
APH 305 Contemporary Architecture <i>HU</i>	3
APH 313 History of Western Architecture I <i>L/HU</i>	3
APH 446 20th-Century Architecture I <i>HU</i>	3
DSC 101 Design Awareness <i>HU, G</i>	3
GRA 318 History of Graphic Design <i>HU</i>	3
IND 316 20th-Century Design I <i>HU, H</i>	3
INT 223 Interior Design Issues and Theories <i>HU</i>	3
INT 310 History of Interior Design I <i>HU, H</i>	3
INT 311 History of Interior Design II <i>HU, H</i>	3
INT 412 History of Decorative Arts in Interiors <i>HU</i>	3
PUP 200 The Planned Environment <i>HU, H</i>	3
PUP 420 Theory of Urban Design <i>HU</i>	3

Bachelor of Science in Design, Major in Housing and Urban Development Professional Program Requirements

Third Year

Fall

CON 383 Construction Estimating	3
HUD 301 Housing and Community Design and Development	3
or CON 477 Residential Construction Business Practices (3)	3
HUD 361 Housing and Urban Development Studio I: Residential Design and Development	2
HUD 363 Housing and Urban Development Seminar I: Residential Design and Development	3
MKT 394 ST: Marketing and Selling	3
or approved business elective	—
Total	14

Spring

CON 389 Construction Cost Accounting and Control <i>CS</i>	3
HUD 302 Housing Production Process	3
HUD 362 Housing and Urban Development Studio II: Community Design and Development	2
HUD 364 Housing and Urban Development Seminar II: Community Design and Development	3
HUD 403 Advanced Topics in Housing and Urban Development	3
Total	14

Summer

HUD 484 Internship	1
PUP 485 International Field Studies in Planning and Landscape Architecture (optional)	1–12
Minimum total	1

Fourth Year

Fall

CON 495 Construction Planning and Scheduling CS	3
HUD 401 Assisted Housing	3
HUD 461 Housing and Urban Development Studio III: Comprehensive Housing Development Process	2
HUD 463 Housing and Urban Development Seminar III: Comprehensive Housing Development Process	3
PUP 452 Ethics and Theory in Planning L.....	3
Total	14

Spring

HUD 402 Community Revitalization: Problems and Strategies	3
HUD 462 Housing and Urban Development Studio IV: Neighborhood Revitalization Process	2
HUD 464 Housing and Urban Development Seminar IV: Neighborhood Revitalization Process	3
PUP 433 Zoning Ordinances, Subdivision Regulations, and Building Codes	3
or PUP 432 Planning and Development Control Law (3)	
Approved elective in computers*.....	3
Total	14
Professional program total	57
B.S.D.-HUD minimum total	120

* CON 251 Microcomputer Applications for Construction is suggested.

INQUIRIES

For more information, contact a college academic advisor:

COLLEGE OF ARCHITECTURE AND
ENVIRONMENTAL DESIGN
ARIZONA STATE UNIVERSITY
PO BOX 871605
TEMPE AZ 85287-1605

HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 161 Graphic Communication. (3)

fall and spring

Develops drawing skills and understanding of the graphic communication systems used by planning, homebuilding, and landscape architecture professions. Studio. Cross-listed as PLA 161/PUP 161. Credit is allowed for only HUD 161 or PLA 161 or PUP 161.

HUD 201 Introduction to Housing and Urban Development. (3)

spring

Perspectives and issues concerning HUD. Guest lectures by interdisciplinary faculty and private, public, and nonprofit practitioners.

HUD 301 Housing and Community Design and Development. (3)

fall

Single and multi-family housing, residential neighborhoods, and planned communities. Affordability in owner-occupied and rental housing. First-time, move-up, and adult markets.

HUD 302 Housing Production Process. (3)

spring

Development feasibility analysis, finance, contracts, land acquisition, community and permit presentation and negotiation, scheduling, cost control, marketing, and sales.

HUD 361 Housing and Urban Development Studio I: Residential Design and Development. (2)

fall

Affordable residential design, development, and production process. Studio. Pre- or corequisites: HUD 301, 363; upper-division HUD major.

HUD 362 Housing and Urban Development Studio II: Community Design and Development. (2)

spring

Neighborhood and new community design and development process. Studio. Pre- or corequisites: HUD 301, 361, 363, 364; upper-division HUD major.

HUD 363 Housing and Urban Development Seminar I: Residential Design and Development. (3)

fall

Affordable residential design, development, and production process. Seminar. Pre- or corequisites: HUD 301, 361; upper-division HUD major.

HUD 364 Housing and Urban Development Seminar II: Community Design and Development. (3)

spring

Neighborhood and new community design and development process. Seminar. Pre- or corequisites: HUD 301, 361, 362, 363; upper-division HUD major.

HUD 401 Assisted Housing. (3)

fall

Publicly-subsidized and non-profit housing. Policy, implementation, and administration. FHA, Section 8, FmHA, projects and scatter site, and tax considerations.

HUD 402 Community Revitalization: Problems and Strategies. (3)

spring

Public policy and strategies for neighborhood revitalization and community renewal. Preservation and adaptive reuse, gentrification, neighborhood safety, and related socioeconomic concerns.

HUD 403 Advanced Topics in Housing and Urban Development. (3)

fall and spring

Varying topics, such as manufactured housing, homelessness, mortgage and finance in housing, housing abroad, marketing housing, and sustainable community development.

HUD 461 Housing and Urban Development Studio III: Comprehensive Housing Development Process. (2)

fall

Comprehensive development process simulation. Feasibility analysis, finance, design, community and permit presentation, construction, cost management, and marketing. Studio. Pre- or corequisites: HUD 302, 463; upper-division HUD major.

HUD 462 Housing and Urban Development Studio IV: Neighborhood Revitalization Process. (2)

spring

Housing rehabilitation, neighborhood revitalization, and urban infill. CDBG, empowerment-enterprise zoning, code enforcement, citizen participation, etc. Studio. Pre- or corequisites: HUD 401, 402, 464; upper-division HUD major.

HUD 463 Housing and Urban Development Seminar III: Comprehensive Housing Development Process. (3)

fall

Comprehensive development process simulation. Feasibility analysis, finance, design, community and permit presentation, construction and cost management, and marketing. Seminar. Pre- or corequisites: HUD 302, 461; upper-division HUD major.

HUD 464 Housing and Urban Development Seminar IV: Neighborhood Revitalization Process. (3)

spring

Housing rehabilitation, neighborhood revitalization, and urban infill. CDBG, empowerment-enterprise zoning, code enforcement, citizen participation, etc. Seminar. Pre- or corequisites: HUD 401, 402, 462; upper-division HUD major.

HUD 484 Internship. (1)

summer

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

LANDSCAPE ARCHITECTURE (PLA)

PLA 101 Landscape and Society. (3)

fall

Examines interrelationship between society and the landscape with emphasis on human involvement in shaping the landscape.

General Studies: HU, G

PLA 161 Graphic Communication. (3)

fall and spring

Develops drawing skills and understanding of the graphic communication systems used by planning, homebuilding, and landscape architecture professions. Studio. Cross-listed as HUD 161/PUP 161. Credit is allowed for only HUD 161 or PLA 161 or PUP 161.

PLA 222 Computers in Landscape Architecture. (3)

spring

Computer applications in landscape architecture including CAD, GIS, graphics, and visualization. Lab.

General Studies: CS

PLA 240 Landscape Survey Techniques. (3)

fall

Develops landscape survey skills including aerial photography, satellite images, geo-referencing, landscape surveys, and field data collection. Lecture, lab.

PLA 242 Landscape Construction I. (4)

spring

Landscape constructions focusing on landform transformations. Topics include landform analysis, grading, and earthwork. Studio. Prerequisite: admission to professional program.

PLA 261 Landscape Architecture I. (4)

fall

Landscape communication: communication techniques for urban planning and landscape architecture. Studio. Prerequisites: ADE 120; GPH 111.

PLA 262 Landscape Architecture II. (4)

spring

Reading the landscape: observing, experiencing, and graphically expressing the symbolic and aesthetic significance of natural landscapes. Prerequisites: ADE 120; PLA 261; admission to professional program.

PLA 310 History of Landscape Architecture. (3)

fall

Physical record of human attitudes toward the land. Ancient through contemporary landscape planning and design. Cross-listed as APH 411. Credit is allowed for only APH 411 or PLA 310.

General Studies: H

PLA 311 Contemporary Landscape Architecture. (3)

fall

Explores concerns, projects, and movements in landscape architecture of late 20th-century understanding; social, ecological, regional, and historical influences.

PLA 322 Computers in Planning. (3)

spring

Planning methods using database, word processors, spreadsheets, CAD, and mapping packages on microcomputers. Lecture, lab. Cross-listed as PUP 322. Credit is allowed for only PLA 322 or PUP 322.

PLA 344 Landscape Construction II. (4)

fall

Characteristics of materials and methods used in landscape architectural construction. Studio. Prerequisite: PLA 242 or instructor approval.

PLA 345 Professional Practice Seminar. (1)

spring

Landscape architecture practice including contracts, project and office management, liability, licensing, and professional development.

PLA 361 Landscape Architecture III. (4)

fall

Site planning: analysis of natural and cultural features; site systems and implications for plan making and design. Studio. Fee. Prerequisite: admission to professional program.

PLA 362 Landscape Architecture IV. (4)

spring

Site design: site-specific design of configured space by the creative development of form. Studio. Fee. Prerequisite: admission to professional program.

PLA 363 Landscape Planting Design. (4)

spring

Functional and aesthetic use of plants in arid-region landscape design. Explores design philosophies through planting design problems. Studio. Prerequisite: admission to professional program.

PLA 410 Social Factors in Landscape and Urban Planning. (3)

fall

Examines the influence of social factors in landscape architecture and urban planning.

PLA 411 Landscape Architecture Theory and Criticism. (3)

spring

Critically analyzes landscape architecture theories and projects to evaluate validity of design and contribution to society. Prerequisites: PLA 310, 361, 362, 420, 461.

General Studies: L

PLA 412 Landscape Ecology and Planning. (3)

spring

Reviews the evolution of landscape ecology and landscape planning and examines use and value.

PLA 413 Southwest Landscape Interpretation. (3)

spring

Explores methods and implications of landscape interpretation within the American Southwest.

PLA 420 Theory of Urban Design. (3)

spring

Analyzes the visual and cultural aspects of urban design. Theories and techniques applied to selected study models. Prerequisite: junior standing.

General Studies: HU

PLA 446 Landscape Construction III. (3)

spring

Landscape construction focusing on low-technology, biotechnical, regional, and experimental techniques or systems. Lecture, studio.

PLA 461 Landscape Architecture V. (4)

fall

Landscape ecological planning: collection and application of ecological data relevant to planning and design at landscape scale. Studio. Fee. Prerequisite: PLA 362.

PLA 462 Landscape Architecture VI. (4)

spring

Advanced landscape architecture: integrative capstone studio with multifaceted design problems. Fee. Prerequisite: PLA 461.

PLA 484 Internship. (3)

fall, spring, summer session 1

Full-time internship under the supervision of practitioners in the Phoenix area or other locales. Credit/no credit. Prerequisite: school major or instructor approval.

PLA 485 International Field Studies in Planning and Landscape Architecture. (1–12)

fall, spring, summer

Organized field study of planning and landscape architecture in specified international locations. May be repeated for credit with school approval. Study abroad. Cross-listed as PUP 485. Credit is allowed for only PLA 485 or PUP 485.

General Studies: G

PLA 494 Special Topics. (1–4)

fall and spring

Possible topics:

(a) Plant Materials. (3)

PLA 498 Pro-Seminar. (1–7)

spring

Possible topics:

(a) Professional Senior Seminar. (1)

URBAN AND ENVIRONMENTAL PLANNING (PUP)**PUP 100 Introduction to Environmental Design. (3)***fall and spring*

Survey of environmental design: includes historic examples and the theoretical, social, technical, and environmental forces that shape them. Cross-listed as APH 100/DSC 100. Credit is allowed for only APH 100 or DSC 100 or PUP 100.

*General Studies: HU, G, H***PUP 161 Graphic Communication. (3)***fall and spring*

Develops drawing skills and understanding of the graphic communication systems used by planning, home building, and landscape architecture professions. Studio. Cross-listed as HUD 161/PLA 161. Credit is allowed for only HUD 161 or PLA 161 or PUP 161.

PUP 200 The Planned Environment. (3)*fall*

Environmental, aesthetic, social, economic, political, and other factors influencing urban development.

*General Studies: HU, H***PUP 236 Introduction to Computer Modeling. (3)***fall and spring*

Fundamentals of computer operation, geographic information systems, geometric modeling of three-dimensional forms and rendering of light, mathematical modeling of processes using spreadsheets. Lab. Prerequisite: major in the College of Architecture and Environmental Design.

*General Studies: CS***PUP 261 Urban Planning I. (4)***fall*

Planning communication: communication techniques for urban planning and landscape architecture communication. Prerequisites: ADE 120; PLA 261 (or PUP 262).

PUP 262 Urban Planning II. (4)*spring*

Reading the landscape: observing, experiencing, and graphically expressing the symbolic and aesthetic significance of natural landscapes. Studio. Prerequisites: ADE 120; GPH 111.

PUP 301 Introduction to Urban Planning. (3)*fall, spring, summer*

Theoretical and practical aspects of city planning. Interrelationships among physical planning, environment, government, and society.

*General Studies: L***PUP 322 Computers in Planning. (3)***spring*

Planning methods using database, word processors, spreadsheets, CAD, and mapping packages on microcomputers. Lecture, lab. Cross-listed as PLA 322. Credit is allowed for only PLA 322 or PUP 322.

PUP 361 Urban Planning III. (4)*fall*

Site planning: analysis of natural and cultural features; site systems and implications for plan making and design. Studio. Fee. Prerequisite: school major or instructor approval.

PUP 362 Urban Planning IV. (4)*spring*

Neighborhood planning: local community plan making; urban development and neighborhood improvement. Studio. Fee. Prerequisite: PUP 361 or instructor approval.

PUP 363 History of Planning. (3)*spring*

Historical overview of western urban and regional planning and planning theory, focusing on the 19th and 20th centuries.

PUP 412 History of the City. (3)*fall*

The city from its ancient origins to the present day. Emphasis on European and American cities during the last five centuries. Cross-listed as APH 414. Credit is allowed for only APH 414 or PUP 412.

*General Studies: H***PUP 420 Theory of Urban Design. (3)***spring*

Analyzes the visual and cultural aspects of urban design. Theories and techniques applied to selected study models. Prerequisite: junior standing.

*General Studies: HU***PUP 424 Planning Methods. (4)***fall*

Tools useful for urban planning research; emphasis on research design and survey methods. Studio. Prerequisite: PUP 301 or instructor approval.

PUP 425 Urban Housing Analysis. (3)*fall*

Nature, dimensions, and problems of urban housing, government policy environment, and underlying economics of the housing market.

PUP 430 Transportation Planning and the Environment. (3)*spring*

Overview of transportation planning from the perspective of land use planning, economic development, environmental planning, and social needs. Lecture, discussion. Prerequisite: junior standing or instructor approval.

PUP 432 Planning and Development Control Law. (3)*fall*

Case studies on police power, eminent domain, zoning, subdivision controls, exclusion, preservation, urban redevelopment, and aesthetic and design regulation.

PUP 433 Zoning Ordinances, Subdivision Regulations, and Building Codes. (3)*fall and spring*

Analyzes zoning ordinances, subdivision regulations, building codes, and other planning implementation techniques relative to local development.

PUP 434 Urban Land Economics. (3)*spring*

Interaction between space and economic behavior. Examines the use and value of land through economic theories.

PUP 436 City Structure and Planning. (3)*spring*

Political structure and organization of government as it relates to planning. Prerequisite: PUP 301.

PUP 442 Environmental Planning. (3)*fall*

Environmental planning problems, including floodplains, water quality and quantity, solid and hazardous waste, air quality, landslides, and noise. Field trips. Prerequisite: PUP 301 or instructor approval.

PUP 444 Preservation Planning. (3)*spring*

History, theory, and principles of historic preservation. Emphasis on legal framework and methods practiced. Lecture, off-campus field study. Prerequisite: instructor approval.

PUP 445 Women and Environments. (3)*fall*

Examines the role women play in shaping the built environment; ways built/natural forms affect women's lives. Focuses on contemporary U.S. examples. Prerequisite: upper-division or graduate status.

*General Studies: C***PUP 450 Environmental Planning Economics. (3)***fall*

Introductory course in the applications and limitations of economics in environmental planning and policy making. Emphasizes applications rather than theoretical details, the importance of ecological knowledge.

PUP 452 Ethics and Theory in Planning. (3)*fall*

Ethics and theory of professional planning practice in urban and regional communities. Prerequisite: upper-division standing or instructor approval.

General Studies: L

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

PUP 461 Urban Planning V. (4)*fall*

Comprehensive planning: collection and analysis of economic, social, and environmental data relevant to urban planning; development of land-use plans. Studio. Fee. Prerequisite: PLA 362 or PUP 362 or instructor approval.

PUP 462 Urban Planning VI. (4)*spring*

Capstone studio: project focusing on synthesis aspects of plan making. Studio. Fee. Prerequisite: PUP 461 or instructor approval.

PUP 475 Environmental Impact Assessment. (3)*spring*

Criteria and methods for compliance with environmental laws; development of skills and techniques needed to prepare environmental impact statements/assessments.

PUP 484 Internship. (1–12)*fall, spring, summer session 1*

Full-time internship under the supervision of practitioners in the Phoenix area or other locale. Credit/no credit. Prerequisite: school major or instructor approval.

PUP 485 International Field Studies in Planning and Landscape Architecture. (1–12)*fall, spring, summer*

Organized field study of planning and landscape architecture in specified international locations. May be repeated for credit with school approval. Study abroad. Cross-listed as PLA 485. Credit is allowed for only PLA 485 or PUP 485.

*General Studies: G***PUP 494 Special Topics. (1–4)***fall and spring*

Possible topics:

- (a) Environmental Planning Economics. (3)

PUP 498 Pro-Seminar. (1–7)*fall*

Possible topics:

- (a) Senior Pro-Seminar. (1)

PUP 501 The Idea of Planning. (3)*fall*

Comprehensive review of planning profession within a political, governmental, multicultural, and gender framework.

PUP 510 Citizen Participation. (3)*spring*

Theory and practice of citizen participation in planning. Examines and critiques participation techniques and roles of planners. Prerequisite: instructor approval.

PUP 520 Planning Theories and Processes. (3)*fall*

Reviews past and current theoretical developments related to social change perspectives, the role and ethics of planners. Prerequisite: instructor approval.

PUP 524 Planning Methods I: Planning Research Methods. (3)*fall*

Tools useful for urban planning research; emphasis on research design and survey methods. Prerequisite: PUP 301 or instructor approval.

PUP 525 Urban Housing Analysis. (3)*fall*

Nature, dimensions, and problems of urban housing, government policy environment, and underlying economics of the housing market.

PUP 531 Planning and Development Control Law. (3)*spring*

Case studies on police power, eminent domain, zoning, subdivision controls, exclusion, preservation, urban redevelopment, and aesthetic and design regulation.

PUP 532 Advanced Urban Planning Law. (3)*spring*

Advanced study on selected issues in planning law, such as urban design controls, exclusionary practices, compensable regulation, and tax policy. Prerequisite: PUP 432 or instructor approval.

PUP 542 Environmental Administration and Planning. (3)*spring*

Environmental administration of policies and their relationship to environmental planning practices. Prerequisite: PUP 442.

PUP 544 Urban Land Use Planning. (3)*spring*

Theory and methods of urban land use planning, including the rational planning process, comprehensive, functional, and neighborhood plans. Prerequisite: PUP 301 or instructor approval.

PUP 546 Urban Design Policy. (3)*not regularly offered*

Advanced study of local, state, and federal urban design policy. Prerequisite: PLA 420 or PUP 420.

PUP 550 Environmental Planning Economics. (3)*fall*

Introductory course in the applications and limitations of economics in environmental planning and policy making. Emphasizes applications rather than theoretical details, the importance of ecological knowledge.

PUP 561 Urban Design Studio. (4)*not regularly offered*

Current urban form and urban landscape design problems within the Phoenix-centered region. Studio. Prerequisite: PLA 420 or PUP 420 or instructor approval.

PUP 572 Planning Studio I: Data Inventory and Analysis. (4)*fall*

Comprehensive planning workshop dealing with real community problems. Focuses on the data gathering and analysis steps of the planning process. Fee. Prerequisite: Master of Environmental Planning major or instructor approval.

PUP 574 Planning Studio II: Options and Implementation. (4)*spring*

Comprehensive planning workshop dealing with real community problems. Focuses on the development of options, plan making, and plan implementation. Studio. Fee. Prerequisite: PUP 572 or instructor approval.

PUP 575 Environmental Impact Assessment. (3)*spring*

Criteria and methods for compliance with environmental laws; develops skills and techniques needed to prepare environmental impact statements/assessments.

PUP 576 GIS Studio. (3)*spring*

GIS as a tool to address large, multifaceted planning problems. Prerequisites: a combination of GPH 373 (or 598) and PAF 591 and PUP 322 or only instructor approval.

PUP 584 Internship. (3)*fall, spring, summer session 1*

Internship under the supervision of practitioners in the Phoenix area or other locales. Credit/no credit.

PUP 599 Thesis. (1–12)*not regularly offered*

Fee.

PUP 622 Planning Methods II: Quantitative Planning Analysis. (3)*spring*

Methods and models used as the basic quantitative techniques of urban, regional, and environmental planning and policy analysis. Prerequisites: PUP 424; statistics; instructor approval.

PUP 642 Land Economics. (3)*fall*

Land use and locational impact of economic activity and the urban real property market. Prerequisite: instructor approval.

PUP 644 Public Sector Planning. (3)*spring*

Urban fiscal problems and public goods provision in state and local governments. Prerequisites: 1 course in microeconomics; instructor approval.

College of Business

Larry E. Penley, Ph.D., Dean

www.cob.asu.edu



Students on the plaza outside the Business Administration building

Tim Trumble photo

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PURPOSE

The mission of the College of Business is to expand the knowledge of business and to educate men and women for managerial leadership through research activities and professional educational programs. These programs address issues of importance to future managers in a world characterized by demands for continuous improvements in quality; growing sophistication of information technology; globalized markets; racial, cultural, and gender diversity in the workforce; and a demand for managers with practical, realistic skills.

Students have many opportunities to supplement their academic experiences. The college offers an honors program for academically talented students, an Academic Access Program to assist underrepresented and other targeted students, an international component to provide a variety of international opportunities, an internship program that provides related practical experience, and 18 cocurricular organizations to increase student interaction and learning.

The college is a member of AACSB—the International Association for Management Education, the official accrediting organization in the field of business. The undergraduate and graduate programs and the School of Accountancy and Information Management are accredited by this organization.

The college is host to a chapter of Beta Gamma Sigma, a national society that recognizes high academic achievement in AACSB-accredited schools. Selection to Beta Gamma Sigma is the highest scholastic honor a student in business can earn.

In addition to the regular degree curricula, other programs of study in the college are designed to meet special needs. Selected majors are available in the evening, and continuing education courses are conducted for qualified persons who are regularly employed and who otherwise would be unable to enroll in college courses. Short courses and institutes on a noncredit basis are organized in cooperation with various business groups for the furtherance of in-service training of employed personnel.

The college works in partnership with the business community, and the board of the Dean's Council of 100 serves as a primary source of advice and counsel for the college. Through the various divisions of the L. William Seidman Research Institute, the college reaches out to the business community through research and executive education. For more information, access the college's Web site at www.cob.asu.edu.

ORGANIZATION

The courses offered by the College of Business are organized into groups so that a related sequence may be established for the various subject fields. For administrative purposes, these fields are organized into the following academic units:

School of Accountancy and Information Management
 Department of Economics
 Department of Finance
 School of Health Administration and Policy
 Department of Management
 Department of Marketing
 Department of Supply Chain Management

ADMISSION

The Prebusiness Program. Each student admitted to the College of Business is designated as a prebusiness student. The student follows the freshman and sophomore sequence of courses listed in the curriculum outline. Students are required to follow the recommendations of an academic advisor in completing the prescribed background and skill courses in preparation for the subsequent professional program. The skill courses follow.

ACC 230	Uses of Accounting Information I.....	3
ACC 240	Uses of Accounting Information II.....	3
CIS 200	Computer Applications and Information Technology CS.....	3
ECN 111	Macroeconomic Principles <i>SB</i>	3
ECN 112	Microeconomic Principles <i>SB</i>	3
	Choose between the course combinations below.....	6 or 3
	ENG 101 First-Year Composition (3)	
	ENG 102 First-Year Composition (3)	
	————— <i>or</i> —————	
	ENG 105 Advanced First-Year Composition (3)	
	————— <i>or</i> —————	
	ENG 107 English for Foreign Students (3)	
	ENG 108 English for Foreign Students (3)	
MAT 119	Finite Mathematics <i>MA</i>	3
MAT 210	Brief Calculus <i>MA</i>	3
QBA 221	Statistical Analysis <i>CS</i>	3
Total	.....	27 or 30

Accountancy and Computer Information Systems majors should refer to their specific requirements under the “School of Accountancy and Information Management,” page 156, which lists variations in the skill courses.

Completion of lower-division requirements does not ensure acceptance to the upper-division professional program. Prebusiness students are not allowed to register for 300- and 400-level business courses.

The Professional Program. The junior and senior years constitute the professional program of the undergraduate curriculum. Admission to the professional program is competitive and limited by available resources. Admission is awarded to those applicants demonstrating the highest promise for professional success.

Students who wish to apply to the College of Business professional program must submit an application during one of the three annual application periods. Candidates are strongly encouraged to visit the Undergraduate Programs Office, BA 123, at the beginning of the semester in which they wish to apply to pick up information regarding academic qualifications, admissions criteria, and application

deadlines. The application can be found on the Web at www.cob.asu.edu/up/index.cfm. All applicants must be admitted to ASU by the time they submit their professional program application. Students are also encouraged to complete the Business Basics workshop before applying to the professional program.

Nonbusiness Students. A nonbusiness student is permitted to register for selected 300- and 400-level business courses only during online registration and only if, (1) at the time of registration, the student has junior standing (56 semester hours completed) and (2) the student has a minimum cumulative GPA of 2.50 at ASU and a minimum GPA of 2.50 for all business courses completed at ASU. Students who have 56 semester hours completed but have never attended ASU are given a one-semester period to register and to establish a GPA at ASU. Students must meet all prerequisites and course requirements as listed in the catalog.

Nonbusiness majors are limited to a maximum of 15 semester hours of selected upper-division business courses (excluding ECN courses).

Bachelor of Interdisciplinary Studies. The College of Business participates in the Bachelor of Interdisciplinary Studies degree. For details, refer to “Bachelor of Interdisciplinary Studies,” page 108.

Minors. Two minors are available to nonbusiness students: a minor in Business and a minor in Small Business. To complete either of the minors, students must obtain the requirements from the Undergraduate Programs Office in the College of Business and complete the specified business courses with a grade of “C” or higher. Courses used in a student’s major may not be used toward a minor. Students are advised to consult an advisor in the colleges of their majors to ensure the proper selection of courses for the minor. The upper-division courses for the minor are restricted to students with 56 hours who are in good standing (a 2.00 ASU GPA or better). For details on the minor in Small Business, see “Small Business Programs,” page 174.

Nondegree Undergraduate and Graduate Students. A nondegree undergraduate or graduate student is permitted to enroll in selected 300- and 400-level business courses only during online registration and only if (1) the student has an ASU cumulative GPA of at least 2.50 and an ASU cumulative business GPA of at least 2.50 at the time of online registration or (2) the student has never attended ASU, in which case he or she is given a one-semester period to register during online registration and to establish a GPA at ASU. Students must meet all prerequisites and course requirements as listed in the catalog.

Nondegree undergraduate and graduate students are limited to a maximum of 15 semester hours of selected upper-division business courses (excluding ECN courses).

ADVISING

The student should follow the sequence of courses in the “Curriculum Outline Prebusiness Program” section, page 151, and the recommendations of the academic advisor in completing the prescribed background and skill courses in preparation for the subsequent professional program.

For more advising information, access the Undergraduate Programs Web site at www.cob.asu.edu/up/indexupo.cfm.

Curriculum Outline Prebusiness Program

First Year

First Semester

ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
ENG 101 First-Year Composition.....	3
or ENG 107 English for Foreign Students (3)	
MAT 210 Brief Calculus <i>MA</i>	3
General Studies.....	3
PGS or SOC course.....	3
Total.....	15

Second Semester

COM 100 Introduction to Human Communication <i>SB</i>	3
or COM 230 Small Group Communication <i>SB</i> (3)	
or COM 259 Communication in Business and the Professions (3)	
ECN 112 Microeconomic Principles <i>SB</i>	3
or ECN 111 Macroeconomic Principles <i>SB</i> (3)	
ENG 102 First-Year Composition.....	3
or ENG 108 English for Foreign Students (3)	
MAT 119 Finite Mathematics <i>MA</i>	3
Laboratory science <i>SQ</i>	4
Total.....	16

Second Year

Third Semester

ACC 230 Uses of Accounting Information I.....	3
QBA 221 Statistical Analysis <i>CS</i>	3
General Studies.....	3
Laboratory science <i>SQ/SG</i>	4
PGS or SOC course.....	3
Total.....	16

Fourth Semester

ACC 240 Uses of Accounting Information II.....	3
CIS 200 Computer Applications and Information Technology <i>CS</i>	3
General Studies.....	9
Total.....	15
Prebusiness program total.....	62

Accountancy and Computer Information Systems majors should refer to their specific course requirements under the "School of Accountancy and Information Management," page 156, which lists course requirement variations.

Students are encouraged to have College Algebra (MAT 117) proficiency before registering in ECN 111 and 112. ECN 111 and 112 may be taken during the second and third semesters without any delay in the prebusiness program.

Professional Program. Students admitted to the professional program should select the necessary upper-division business courses to complete the major by consulting their departmental advising guide, with an academic advisor, or with a faculty advisor. Professional program students must complete BUS 301 and COB 301 during their first semester in the professional program.

Transfer Credit. Credit from other institutions is accepted subject to the following guidelines. Students planning to take their first two years of work at a community college or

another four-year college should take only those courses in business and economics that are offered as freshman- or sophomore-level courses at any of the state-supported Arizona universities. These lower-division courses are numbered 100 through 299. *A maximum of 30 hours of business and economics courses from community colleges are accepted toward a bachelor's degree in business.*

Students may transfer a maximum of nine semester hours of approved upper-division business course work required for the business degree to ASU Main. Professional business courses taught in the junior or senior year in the state universities may not be completed at a two-year college for transfer credit in the business core or major. The introductory course in the legal, ethical, and regulatory issues in business is accepted as an exception to this policy, but only lower-division credit is granted. Such courses may be utilized in the free elective category *subject to the 30-hour limitation*. Courses taught as vocational or career classes at the community colleges that are not taught in the colleges of business at any one of the state universities are not accepted for credit toward a bachelor's degree. Courses taught in the upper-division business core at the state universities must be completed at the degree-granting institution unless transferred from an accredited four-year school. Normally, upper-division transfer credits are accepted only from AACSB-accredited schools. To be accepted for credit as part of the professional program in business, all courses transferred from other institutions must carry prerequisites similar to those of the courses they are replacing at ASU.

An Associate in Transfer Partnership degree is available to Maricopa community college students who wish to complete their first two years of course work at a Maricopa community college and transfer to the College of Business without loss of credit. An Associate of Business degree is available to students who wish to complete their first two years of course work at an Arizona community college and transfer to the College of Business without loss of credit. Students should consult with an academic advisor in the Undergraduate Programs Office to plan curriculum requirements and/or access Business Transfer Guides for optimal course selection at www.asu.edu/provost/articulation.

DEGREES

The faculty in the College of Business offer the B.S. degree in Accountancy, Computer Information Systems, Economics, Finance, Management, Marketing, Real Estate, and Supply Chain Management upon successful completion of a four-year curriculum of 120 semester hours. Students may select one of the majors shown in the "College of Business Baccalaureate Degrees and Majors" table, page 152. Each major is administered by the academic unit indicated.

GRADUATE PROGRAMS

The faculty in the College of Business offer graduate degrees as shown in the "College of Business Graduate Degrees and Majors" table, page 153. Students have the opportunity to obtain dual degrees in two years with several master's degree programs in the College of Business, including these examples:

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

College of Business Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Accountancy	B.S.	—	School of Accountancy and Information Management
Computer Information Systems	B.S.	—	School of Accountancy and Information Management
Economics*	B.S.	—	Department of Economics
Finance	B.S.	—	Department of Finance
Management	B.S.	—	Department of Management
Marketing	B.S.	—	Department of Marketing
Real Estate	B.S.	—	Department of Supply Chain Management
Supply Chain Management	B.S.	—	Department of Supply Chain Management

* This major is offered by the College of Liberal Arts and Sciences as well.

M.B.A./M.H.S.A.
 M.B.A./M.S.I.M.
 M.B.A./M.A.I.S.
 M.B.A./M.S. degree in Economics
 M.B.A./M.Tax.

Other concurrent degrees available are as follows:

M.B.A./J.D.
 M.B.A./Master of Architecture
 M.B.A./M.I.M. with American Graduate School of International Management (Thunderbird), Glendale, AZ; ESAN, Lima, Peru; Groupe Ecole Supérieure de Commerce (ESC), Toulouse, France; ITESM-CEM, Mexico City, Mexico; and Universidad Carlos III de Madrid, Madrid, Spain.
 M.S. Nursing/M.H.S.A.

In addition to the full-time M.B.A. program, the evening M.B.A. program offers a high technology M.B.A. at ASU Research Park and an evening M.B.A. at the ASU Downtown Center.

The Executive M.B.A. program is available to those with significant work experience.

For more information about M.B.A. programs, see the *Graduate Catalog*.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see "ASU Extended Campus," page 683, or access the Web site at www.asu.edu/xed.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements.

For more information, see "University Graduation Requirements," page 74.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement for a minimum of 35 hours of approved course work in General Studies, as described under "General Studies," page 78. Note that all three General Studies awareness areas are required.

General Studies courses are listed in the "General Studies Courses" table, page 81, in the course descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

First-Year Composition Requirement

Completion of both ENG 101 and 102 or ENG 105 with a grade of "C" or higher is required for graduation from ASU in any baccalaureate program.

COLLEGE DEGREE REQUIREMENTS

College degree requirements supplement the General Studies requirement with additional course work from the approved university general studies list or the College of Business Policy statement. Business courses may not be used to fulfill college degree requirements except for ECN 111 and 112 and QBA 221.

A well-planned program of study may enable students to complete many General Studies and college degree requirements concurrently. Students are encouraged to consult with an academic advisor in planning a program to ensure that they comply with all necessary requirements.

Specific courses from the following areas must be taken to fulfill the college degree requirement.

Social and Behavioral Sciences. College of Business students must complete ECN 111 and 112, one course with the PGS prefix, and one course with the SOC prefix and may include these courses toward the General Studies requirements.

Mathematical Studies. College of Business students must complete MAT 119 and MAT 210 (or a more advanced MAT course) and QBA 221 and may include these courses toward the General Studies requirements.

Communication. All students in the College of Business except Accountancy majors must complete COM 100, 230, or 259. Accountancy majors must complete COM 230 (or 100) and 259.

Additional Courses. Additional courses, as needed to complete 60 hours (54 hours for Accountancy majors), may be

College of Business Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Accountancy and Information Systems	M.A.I.S.	—	School of Accountancy and Information Management
Business Administration	M.B.A. Ph.D.	— Accountancy, computer information systems, finance, health services research, ¹ management, marketing, supply chain management	College of Business College of Business
Economics	M.S., Ph.D.	—	Department of Economics
Health Services Administration	M.H.S.A.	—	School of Health Administration and Policy
Information Management	M.S.	—	School of Accountancy and Information Management
Public Health	M.P.H. ²	Health administration and policy	School of Health Administration and Policy
Statistics	M.S. ³	—	Committee on Statistics
Taxation	M.Tax.	—	School of Accountancy and Information Management

¹ Applications are not being accepted at this time.

² This collaborative program is offered by the three state universities.

³ This program is administered by the Graduate College.

selected from the General Studies areas (see “General Studies,” page 78) or from the College of Business Policy Statement. Students are encouraged to consult with an academic advisor to ensure that they comply with all necessary requirements. Business courses may not be used to fulfill this requirement except for ECN 111 and 112 and QBA 221.

Additional Graduation Requirements

In addition to completion of courses outlined under “Major Requirements,” on this page, to be eligible for the B.S. degree in the College of Business, a student must

1. have completed at least 30 semester hours at ASU Main;
2. have attained a cumulative GPA of 2.00 or higher for all courses taken at this university, for all business courses taken at this university, and for all courses for the major taken at this university;
3. have earned a “C” or higher in each lower-division core and skill course and each course in the major;
4. have earned a minimum of 51 semester hours in traditional courses that were designed primarily for junior or senior students and were completed in an accredited, four-year institution; and
5. have met all university degree requirements.

Exceptions. Any exception to these requirements must be approved by the Standards Committee of the College of Business.

Declaration of Graduation. A student in a professional program must complete a Declaration of Graduation during the semester in which the student completes 87 semester hours. The Degree Audit Reporting System should be used to guide the student in accomplishing successful completion

of degree requirements in a timely manner. Students who have not met this requirement are prevented from further registration. Some students may be required to complete a Program of Study in place of the Declaration of Graduation. Students should consult their advisors for the proper procedure.

Pass/Fail

Business majors may not include among the credits required for graduation any courses taken at this university on a pass/fail basis. Pass/fail credits taken at another institution may be petitioned for use, but only if the student can demonstrate proof that the pass grade was equivalent to a “C” or higher.

MAJOR REQUIREMENTS

Students seeking a B.S. degree in the College of Business must satisfactorily complete a curriculum of 120 semester hours.

A major consists of a pattern of from 18 to 24 semester hours in related courses falling primarily within a given subject field. Available majors are shown in the “College of Business Baccalaureate Degrees and Majors” table, page 152.

Major Proficiency Requirements. Students must receive grades of “C” or higher in upper-division courses for the major. If a student receives a grade below “C” in any course in the major, this course must be repeated. If a second grade below “C” is received in either an upper-division course in the major already taken or in a different upper-division course in the major, the student is no longer eligible to take additional upper-division courses in that major. University policy states a course may be repeated only one time.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Business Core Requirements

To obtain an understanding of the fundamentals of business operation and to develop a broad business background, every student seeking a B.S. degree in the College of Business must complete the following courses:

Lower-Division Business Core

ACC 230	Uses of Accounting Information I.....	3
ACC 240	Uses of Accounting Information II.....	3
CIS 200	Computer Applications and Information Technology CS.....	3
	Lower-division business core total.....	9

Upper-Division Business Core

BUS 301	Fundamentals of Management Communication <i>L</i> (first semester).....	3
COB 301	Business Forum (first semester).....	1
FIN 300	Fundamentals of Finance.....	3
LES 305	Legal, Ethical, and Regulatory Issues in Business.....	3
MGT 301	Management and Organization Behavior.....	3
MKT 300	Principles of Marketing.....	3
SCM 300	Global Supply Operations.....	3
	International business course.....	3
	Upper-division business core total.....	22
	Business core total.....	31

Accountancy and Computer Information Systems majors should refer to their specific requirements under the "School of Accountancy and Information Management," page 156, which lists variations in the business core courses.

Elective Courses

Sufficient elective courses are to be selected by the student to complete the total of 120 semester hours required for graduation.

ACADEMIC STANDARDS

Probation. All students, freshman through senior, must maintain a minimum GPA of 2.00 for all courses completed at ASU. If these standards are not maintained, the student is placed on probation. Students on probation must attend an Academic Success Workshop.

Disqualification. Students on probation must obtain a semester GPA of 2.50 with no grade lower than a "C." If a student on probation meets this requirement, but their cumulative GPA remains below 2.00 the student is given an additional semester on continued probation. At the end of continued probation, the student must return to good standing (a GPA of 2.00) to avoid disqualification.

Students who have been academically disqualified are not permitted to enroll in upper-division business courses during summer sessions.

Reinstatement and Readmission. Students seeking reinstatement (after disqualification) or readmission (after an absence from the university) should contact the Undergraduate Programs Office regarding procedures and guidance for returning to good standing.

Academic Dishonesty. The faculty of the College of Business follow the guidelines in the Student Academic Integrity Policy on academic dishonesty. A copy of the policy may be obtained in the Undergraduate Programs Office.

Student Appeal Procedure on Grades. The faculty of the College of Business have adopted a policy on the student appeal procedure on grades. A copy of the policy may be obtained in the Undergraduate Programs Office.

SPECIAL PROGRAMS

Academic Access Program. The primary mission of the Academic Access Program (AAP) is to help the underrepresented and first generation college student populations of the College of Business successfully navigate the college's rigorous academic demands. To that end, the office manages a number of programs to assist students, including these:

- Academic advising
- Advising ethnic student business organizations
- Mentoring
- Ongoing seminar and workshop series on study, work issues, and strategies
- Referring students to other campus support offices
- Teaching academic success courses COB 194 and 294
- Tutoring

For more information, visit BA 122, call 480/965-4066, or access the AAP Web site at www.cob.asu.edu/up/aap. You may also send faxes to 480/965-8259.

Asian Studies. Students in the College of Business may pursue a program with an emphasis in Asian studies as part of the B.S. degree requirements in business. After completing the prerequisite of two years of course work (or the equivalent) in an East Asian language, at least 30 semester hours of the program must be in Asian studies content courses. The Asian studies content program must be approved by the Center for Asian Studies (see "Asian Studies," page 324). Fulfillment of the requirements is recognized on the transcript as a bachelor's degree with a designation of the Asian studies discipline. It is possible to complete the certificate program in International Business Studies and the Asian studies emphasis concurrently. For more information, visit the Center for Asian Studies, in WHALL 105, or call 480/965-7184.

Certificate in Small Business and Entrepreneurship. A curriculum in small business and entrepreneurship is available to business majors at ASU. See "Small Business Programs," page 174.

Certificate in International Business Studies. See "Certificate in International Business Studies," page 166, for requirements.

Certificate in Quality Analysis. The program of study leading to the Certificate in Quality Analysis prepares students to perform technical analyses associated with quality measurement and improvement of manufacturing and service processes. Graduates with the ability to implement these analyses are in high demand in the marketplace. This program is not a substitute for the listed areas of business specialization; rather, the courses required for the certificate add quantitative strength and implementation skills for quality tools to the student's chosen field of specialization.

Students are required to complete a bachelor's degree from any of the major fields of study at ASU and to complete a minimum of 15 semester hours of approved course work, including the following nine hours:

OPM 450 Changing Business Processes L.....3
 QBA 321 Applied Quality Analysis I L3
 QBA 421 Applied Quality Analysis II3

To complete the certificate, the student selects at least six additional hours of course work related to quality analysis approved in advance by the advisor for the certificate program. The student must also complete the 15 hours of course work with a minimum GPA of 2.50.

Honors Program. College of Business students who have been admitted to the Barrett Honors College and the professional program are eligible to participate in the Business Honors Program.

The Business Honors Program provides opportunities for academically talented undergraduate business students to interact with other leading students, faculty, and business professionals inside and outside the classroom. The result is a challenging and enriched education experience that is valuable for professional career or graduate work.

To be admitted into the Business Honors Program, students must meet the following criteria:

1. be enrolled in the Barrett Honors College,
2. have a cumulative GPA of 3.40 or higher,
3. be admitted into the college’s professional program, and
4. have sufficient time to complete the honors requirements.

Upon acceptance into the program, a valuable learning experience begins. The honors course work consists of HON 171 and 172 The Human Event or HON 394 Special Topics and an additional 18 semester hours of upper-division honors courses, including the following six semester hours:

COB 492 Honors Directed Study.....2
 COB 494 ST: Honors Research1
 --- 493 Honors Thesis*3

* See “Honors Courses,” page 52, for an explanation of this course.

The ASU Honors Curriculum normally allows students to complete all requirements within the 120 semester hours of credit required for graduation. All courses taken for honors credit count toward graduation even if the student does not graduate from the Barrett Honors College.

The Business Honors Program emphasizes activities beyond the normal classroom setting in order to broaden the educational experience. Such activities include special honors scholarships, student/faculty mixers, and professional seminars and panel discussions. Students are also encouraged to participate in the Mentoring Program, which allows students the opportunity to interact with local business professionals.

An academic advisor is assigned strictly to assist honors students in course selection, to monitor progress toward the honors recognition, and to be actively involved in career and educational guidance upon completion of the degree.

While the program focuses on students in the professional program, freshman and sophomore honors students

are offered break-out sections in core classes, are invited to attend selected events, and can be assigned a junior or senior honors mentor.

For more information, see “The Craig and Barbara Barrett Honors College,” page 112, call 480/965-8710, or stop by the Business Honors Program Office located in BA 114. You may also send faxes to 480/965-7277. More information may be obtained by accessing the Business Honors Program Web site at www.cob.asu.edu/hon.

Internships. The college encourages students to complement their academic program with career-related work. This practical experience gives students a distinct advantage in the job market when seeking their first full-time professional positions. Additional benefits include industry contacts, a deeper understanding of career options, and monetary compensation that helps students finance their education.

Formal internships and co-ops offer professional work experience and experiential learning opportunities that enrich the student’s academic preparation. Students may undertake internships in the summer or part-time during semesters. Co-op positions are full-time and require a one-semester or longer break in school attendance. The college provides guidelines to companies and encourages them to sponsor internship and co-op positions that benefit both the firm and the student. Both benefit because positions are built around projects and challenging responsibilities that enable students to apply learning acquired in advanced business classes.

ASU Career Services and the College of Business work cooperatively to help students identify and obtain career-related work. The process of obtaining internships and co-ops is a learning opportunity. Students use the same job-search skills and resources that are utilized to obtain permanent career positions. Informational materials, workshops, and required class activities help students learn job-search and career-exploration skills and locate internship and co-op opportunities.

Some academic units within the college offer internship courses. Work assignments for these courses must be approved in advance by a designated faculty member, and all internship courses include an academic component.

For more information, visit the Director of Career Planning and Corporate Relations in BA 122 (480/965-4066), faculty advisors in the departments or Career Services, or access the College of Business Web site at www.cob.asu.edu/up/internship.cfm.

Latin American Studies Center. Students in the College of Business may pursue a program with an emphasis in Latin American area studies. For more information, visit the Latin American Studies Center, in SS 213, or call 480/965-5127.

Prelaw Studies. Prelaw students may pursue a program of study in the College of Business. Courses in accounting, economics, finance, insurance, labor relations, and statistics are recommended for any student planning to enter the legal profession.

The admission requirements of colleges of law differ considerably. The student should communicate with the dean of

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

the law school the student hopes to attend and should plan a program to meet the requirements of that school. Most law schools, including the ASU College of Law, require a baccalaureate degree for admission.

Students who plan to complete a bachelor's degree before entering law school may follow any field of specialization in the College of Business. Within the College of Business are faculty members who are lawyers and who serve as advisors for students desiring a prelaw background.

RESEARCH CENTERS

L. William Seidman Research Institute

The College of Business has eight research centers operating under the umbrella of the L. William Seidman Research Institute. The following centers provide support for faculty research, give opportunities for advanced graduate students' involvement with faculty, and provide information and assistance to the business community on a wide variety of subjects:

- Arizona Real Estate Center
- ASU Manufacturing Institute
- Bank One Economic Outlook Center
- Center for Advanced Purchasing Studies
- Center for the Advancement of Small Business
- Center for Business Research
- Center for Services Marketing and Management
- Center for the Study of Finance

The Seidman Research Institute's mission is to encourage and support applied business research by serving as a public access point to the College of Business, by supporting faculty and student research, by transferring new knowledge to the public, by encouraging the development of education programs grounded in applied business research, and by conducting high-quality, applied business research.

The institute increases the level of funded research by adding support services to facilitate grant preparation and assistance in grant administration and by facilitating the mission of research centers as liaisons between faculty and businesses. In addition, the institute provides desktop publishing services.

For more information, call 480/965-5362, access the institute's Web site at www.cob.asu.edu/seid, or write

L. WILLIAM SEIDMAN RESEARCH INSTITUTE
PO BOX 874011
TEMPE AZ 85287-4011

COLLEGE OF BUSINESS (COB)

COB 294 Special Topics. (1-4)

fall and spring

COB 301 Business Forum. (1)

fall, spring, summer

Provides professional program business students with information on careers, interviewing, job hunting, and résumé skills. Must be taken in the first semester of the professional program for business students. Prerequisite: professional program business student.

COB 380 Small Business Leadership. (3)

fall, spring, summer

Develops leadership skills needed to form, lead, and operate a small business. Emphasis on creating a vision, research, and problem solving. Team teaching, collaborative learning. Prerequisites: 2.00 GPA; 47 hours; non-business major.

COB 381 Small Business Accounting and Finance. (3)

fall and spring

Accounting and finance skills needed by small business owners to acquire, allocate, and track monetary resources and evaluate performance. Team teaching, collaborative learning. Prerequisites: COB 380; 2.00 GPA; 56 hours; non-business major.

COB 382 Small Business Sales and Market Development. (3)

fall and spring

Building and maintaining customers, developing a market identity and a niche, and the importance of sales. Team teaching, collaborative learning. Prerequisites: COB 380; 2.00 GPA; 56 hours; non-business major.

COB 383 Small Business Working Relationships. (3)

fall, spring, summer

Addresses communication and the people in a business—clients, employees, suppliers, competitors, governments, family, and self development. Team teaching, collaborative learning. Prerequisites: COB 380; 2.00 GPA; 56 hours; non-business major.

COB 384 Small Business Operations and Planning. (3)

fall, spring, summer

Planning and executing plans—the what, when, where, how, and who from product/service/project idea to pay back or completion. Team teaching, collaborative learning. Prerequisites: COB 380; 2.00 GPA; 56 hours; non-business major.

COB 394 Special Topics. (1-4)

fall and spring

COB 492 Honors Directed Study. (2)

fall and spring

COB 494 Special Topics. (1-4)

fall and spring

Possible topics:

- (a) Honors Research. (1)

School of Accountancy and Information Management

Philip M.J. Reckers

Director

(BA 223) 480/965-3631

Fax 480/965-8392

www.cob.asu.edu/acct

PROFESSORS

J.R. BOATSMAN, BOYD, GOUL, JOHNSON, KAPLAN, PANY, PEI, PHILIPPAKIS, RECKERS, RENEAU, ROY, SCHULTZ, SMITH, STEINBART, VINZE, WYNDELTS

ASSOCIATE PROFESSORS

C. CHRISTIAN, GOLEN, GUPTA, HWANG, KEIM, KULKARNI, MOECKEL, O'DELL, O'LEARY, REGIER, ST. LOUIS, WHITECOTTON

ASSISTANT PROFESSORS

BHATTACHERJEE, CHEN, CHENOWETH, COMPRIX, DAVID, DOWLING, IYER, O'DONNELL, ROBINSON, SANTANAM, SHAO, WEISS

SENIOR LECTURERS

MACCRACKEN, SHREDNICK

LECTURERS

BALOGH, J.L. BOATSMAN, D. CHRISTIAN, GEIGER, HAYES, TAYLOR, WIGAL

The School of Accountancy and Information Management houses separate undergraduate degree programs in Accountancy and Computer Information Systems. The

school also offers a dual degree program in which students complete requirements for both degree programs (Accountancy and Computer Information Systems) simultaneously. For more information, access the school's Web site at www.cob.asu.edu/acct.

ADMISSIONS

The School of Accountancy and Information Management follows the College of Business policies and procedures for admission to its undergraduate professional programs in Accountancy, Computer Information Systems, and the concurrent degree program of Accountancy and Computer Information Systems.

To be considered for admission to the Accountancy major, a student must meet the College of Business admission requirements, have a grade of "B" or higher in both ACC 230 and 240 or their equivalents, and have a grade of "C" or higher in an introductory computer science course as specified by the school. CIS 220 or its equivalent can be taken in place of CIS 200.

To be considered for admission to the Computer Information Systems major, a student must meet the College of Business admission requirements and have a grade of "C" or higher in an introductory computer science course as specified by the school, in place of CIS 200.

Due to resource limitations, admission to all of the school's programs is very competitive. Approximately one third of all applicants who apply to the professional programs in Accountancy and Computer Information Systems may be admitted. Applicants are reviewed using a portfolio approach. Among the factors considered are cumulative GPA, skill course GPA, transfer GPA and institution (if applicable), work experience, demonstrated community involvement and leadership skills, and responses to questions located in the professional program application. Current admission statistics are available at the Undergraduate Programs Office in the College of Business.

ACCOUNTANCY—B.S.

The major in Accountancy includes the essential academic preparation for students who are

1. pursuing professional careers in public, corporate, and governmental accounting;
2. seeking positions in consulting;
3. planning to operate their own businesses; or
4. planning to pursue a graduate degree to fulfill the profession's 150-hour requirement.

The major in Accountancy consists of the following courses:

ACC 330 Enterprise Process Analysis and Design L.....	4
ACC 340 External Reporting I.....	4
ACC 350 Internal Reporting	4
ACC 430 Taxes and Business Decisions L	4
ACC 440 External Reporting II	4
ACC 450 Principles of Auditing	4
Total	24

As part of the requirements, all Accountancy majors must complete the following courses:

ACC 250 Introductory Accounting Lab	1
COM 100 Introduction to Human Communication ¹ SB	3
or COM 230 Small Group Communication SB (3)	
COM 259 Communication in Business and the Professions	3
ECN 306 Survey of International Economics SB, G ²	3
ENG 301 Writing for the Professions L ³	3
Three approved CIS courses ⁴	9
Total	22

- ¹ See the school for a list of approved courses.
- ² COM 230 is recommended over COM 100.
- ³ ECN 306 is counted in the business core in place of the international business course.
- ⁴ ENG 301 is counted in the business core in place of BUS 301.

Accountancy majors must complete three CIS courses approved by the School of Accountancy and Information Management (one of these courses must be CIS 220 Programming Concepts for Accountancy Majors, which may be used in the business core).

COMPUTER INFORMATION SYSTEMS—B.S.

The major in Computer Information Systems prepares students for professional careers involving the analysis, configuration, programming, and database aspects of the design and implementation of computerized business information systems. The course work prepares the student for a career in business information systems and for admission to graduate programs in information systems or information management.

The major in Computer Information Systems consists of the following courses:

ACC 330 Enterprise Process Analysis and Design L.....	4
CIS 335 Visual Paradigms for Information Systems Development	3
CIS 410 Object-Oriented Modeling and Programming	3
CIS 420 Business Database Concepts	3
CIS 430 Networks and Distributed Systems	3
CIS 440 Systems Design and Electronic Commerce L.....	3
Total	19

All Computer Information Systems majors must complete an introductory computer science course as specified by the school, which may be used as a college requirement, and CIS 235 Business Information Systems Development, which is used in the business core.

MAJOR PROFICIENCY REQUIREMENTS

In addition to college and university requirements, Accountancy and Computer Information Systems majors must receive grades of "C" or higher in the required upper-division major and major support courses. If a student receives a grade below "C" in any required upper-division major course, this course must be repeated before any other upper-division major course can be taken. If a second grade below "C" is received in either an upper-division major course already taken or in a different upper-division major course, the student is no longer eligible to take additional upper-division major courses.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

GRADUATION REQUIREMENTS

In addition to fulfilling major requirements, students seeking a degree must meet all university and college requirements. See “University Graduation Requirements,” page 74 and “College Degree Requirements,” page 152.

ACCOUNTANCY (ACC)

ACC 230 Uses of Accounting Information I. (3)

fall, spring, summer

Introduction to the uses of accounting information focusing on the evolution of the business cycle and how accounting information is used for internal and external purposes. Prerequisite: sophomore standing.

ACC 240 Uses of Accounting Information II. (3)

fall, spring, summer

Introduction to the uses of accounting information focusing on the evolution of the business cycle and how accounting information is used for internal and external purposes. Prerequisites: ACC 230; sophomore standing.

ACC 250 Introductory Accounting Lab. (1)

fall, spring, summer

Procedural details of accounting for the accumulation of information and generation of reports for internal and external users. Lab. Prerequisites: ACC 230; sophomore standing.

ACC 315 Financial Accounting and Reporting. (3)

fall and spring

Accounting theory and practice related to uses of financial statements by external decision makers. Prerequisite: non-Accountancy major. Prerequisites with a grade of “C” or higher: ACC 240, 250.

ACC 316 Management Uses of Accounting. (3)

fall and spring

Uses of accounting information for managerial decision making, budgeting, and control. Prerequisites: ACC 240; non-Accountancy major.

ACC 330 Enterprise Process Analysis and Design. (4)

fall, spring, summer

Analysis and design of efficient and effective business processes. Emphasizes taking advantage of new information technologies to improve managerial decision making. 3 hours lecture, 3 hours lab. Prerequisite: professional program business student majoring in Accountancy or Computer Information Systems.

General Studies: L

ACC 340 External Reporting I. (4)

fall, spring, summer

Financial accounting theory and practice related to external reporting. 3 hours lecture, 3 hours lab. Prerequisites: FIN 300; professional program business student majoring in Accountancy. Prerequisites with a grade of “C” or higher: ACC 250, 330.

ACC 350 Internal Reporting. (4)

fall, spring, summer

Internal reporting systems for planning, control, and decision making. 3 hours lecture, 3 hours lab. Prerequisites: SCM 300; professional program business student majoring in Accountancy. Prerequisites with a grade of “C” or higher: ACC 250, 330.

ACC 394 Special Topics. (1–4)

fall and spring

Possible topics:

(a) Financial Analysis and Accounting for Small Businesses. (3)

ACC 430 Taxes and Business Decisions. (4)

fall, spring, summer

Federal income taxation of sole proprietors, partnerships, corporations, fiduciaries, and individuals with an emphasis on tax consequences of business and investment decisions. 3 hours lecture, 3 hours lab. Prerequisites: LES 305; professional program business student majoring in Accountancy. Prerequisite with a grade of “C” or higher: ACC 340.

General Studies: L

ACC 432 Problems in Managerial Accounting. (3)

not regularly offered

Cases and computer applications in decision making, planning and control, and capital budgeting. Prerequisite: professional program business student majoring in Accountancy. Prerequisite with a grade of “C” or higher: ACC 350.

ACC 440 External Reporting II. (4)

fall, spring, summer

Continuation of ACC 340 with emphasis on the recognition, research, and resolution of financial reporting issues. 3 hours lecture, 3 hours lab. Prerequisite: professional program business student majoring in Accountancy. Prerequisite with a grade of “C” or higher: ACC 340.

ACC 450 Principles of Auditing. (4)

fall and spring

Standards and procedures in auditing. Planning, evidence gathering and accumulation, and reporting. Ethical and legal considerations. 3 hours lecture, 3 hours lab. Prerequisite: professional program business student majoring in Accountancy. Prerequisite with a grade of “C” or higher: ACC 440.

ACC 467 Management Advisory Services. (3)

not regularly offered

Concepts and methods of providing advisory services with respect to accounting information systems and financial analysis. Administration of consulting practices. Prerequisite: professional program business student majoring in Accountancy. Prerequisite with a grade of “C” or higher: ACC 330.

ACC 494 Special Topics. (1–4)

not regularly offered

ACC 502 Financial Accounting. (3)

once a year

Financial accounting concepts and procedures for external reporting. Prerequisite: M.B.A. degree program student.

ACC 503 Managerial Accounting. (3)

once a year

Managerial accounting concepts and procedures for internal reporting. Prerequisite: M.B.A. degree program student.

ACC 511 Taxes and Business Strategy. (3)

once a year

Economic implications of selected management decisions involving application of federal income tax laws. Recognition of tax hazards and tax savings. Prerequisite: ACC 502 (or its equivalent).

ACC 515 Professional Practice Seminar. (3)

once a year

History, structure, environment, regulation, and emerging issues of the accounting profession.

ACC 521 Tax Research. (3)

once a year

Tax research source materials and techniques. Application to business and investment decisions. Prerequisite: ACC 430.

ACC 533 Application Solutions in the Connected Economy. (3)

not regularly offered

Analysis of software solutions and evaluation methods. Emphasis on current topics such as enterprise modeling, ERP software, and inter-organizational solutions. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

ACC 541 Strategic Innovations in Information and Cost Management. (3)

once a year

Strategic cost management emphasizing contemporary topics, including activity-based costing and strategic uses of information technology systems. Cooperative learning, lecture. Prerequisite: ACC 503 or M.S. in Information Management degree program student or M.A.I.S. degree program student.

ACC 567 Financial Models in Accounting Systems. (3)

once a year

Development and application of financial models by accountants. Analysis of decision support systems as financial modeling environments. Prerequisite: ACC 330.

ACC 571 Taxation of Corporations and Shareholders. (3)

once a year

Tax aspects of the formation, operation, reorganization, and liquidation of corporations and the impact on shareholders. Pre- or corequisite: ACC 521.

ACC 573 Taxation of Pass-Through Entities. (3)

once a year

Tax aspects of the definition, formation, operation, liquidation, and termination of a partnership. Tax planning is emphasized. Pre- or corequisite: ACC 521.

ACC 575 Family Tax Planning and Wealth Transfer Taxation. (3)

once a year

Tax treatment of wealth transfers at death and during life time, with emphasis on tax planning. Pre- or corequisite: ACC 521.

ACC 577 Taxation of Real Estate Transactions. (3)*once a year*

Income tax aspects of acquisition, operation, and disposal of real estate; syndications; installment sales; exchanges; dealer-investor issues; alternative financing; and planning. Prerequisite: ACC 521 or instructor approval.

ACC 582 Information Security of Interorganizational Systems. (3)*not regularly offered*

Function and responsibility of the information security officer.

Advanced topics in security methods and technology. Prerequisite:

M.S. in Information Management degree program student or M.A.I.S. degree program student.

ACC 585 Performance Measurement of Emerging Business Models. (3)*once a year*

Application of quantitative techniques to accounting problems. Prerequisite: ACC 503 or M.S. in Information Management degree program student or M.A.I.S. degree program student.

ACC 586 Shareholder Value Creation and Financial Statement Analysis. (3)*not regularly offered*

Develop skills necessary to exploit financial reporting information in a business environment and appreciation of reporting issues faced by management.

ACC 587 Business Process Integrity Controls. (3)*once a year*

Design and evaluation of computer-based accounting information system. Development of computer-based business models for planning and control. Prerequisite: M.A.I.S. degree program student.

ACC 591 Seminar on Selected ACC Topics. (1–12)*once a year*

Possible topics:

- Computer Security. (3)
- Data Warehouse and Data Mining. (3)
- Electronic Commerce. (3)
- Enterprise Modeling. (3)

COMPUTER INFORMATION SYSTEMS (CIS)**CIS 200 Computer Applications and Information Technology. (3)***fall, spring, summer*

Introduction to business information systems and the use of business application software. Prerequisite: MAT 117 or higher.

General Studies: CS

CIS 220 Programming Concepts for Accountancy Majors. (3)*fall, spring, summer*

Introduction to business computer programming. Program languages such as C and C++ are used to familiarize students with proper programming style and practice. Prerequisite: prebusiness student.

CIS 235 Business Information Systems Development. (3)*fall, spring, summer*

Developing information systems and electronic commerce applications using object-oriented languages (e.g., JAVA). Introduction to business technology and systems analysis. Prerequisites: CSE 100; MAT 119 (or 210).

CIS 300 Computers in Business. (3)*not regularly offered*

Introduction to information systems in business. Use of computers for business problem solving. Prerequisites: CIS 200; professional program business student.

CIS 307 Systems Modeling. (3)*not regularly offered*

Procedures for investigating and analyzing decision systems. Use of special languages as tools of analysis and simulation. Prerequisites: CSE 100; MAT 119 (or 210 or 270); professional program business student.

CIS 335 Visual Paradigms for Information Systems Development. (3)*fall, spring, summer*

Using visual programming languages such as Visual BASIC to implement data structures, file structures, and interfaces in business information systems. Prerequisites: both CSE 100 and professional program business student majoring in Computer Information Systems or both CIS 220 and professional program business student majoring in Accountancy.

CIS 410 Object-Oriented Modeling and Programming. (3)*fall and spring*

Object-oriented modeling of business information systems. Abstract data types and object-oriented programming using a language such as C++. Prerequisite: professional program business student majoring in Computer Information Systems. Prerequisites with a grade of "C" or higher: CIS 235, 335.

CIS 420 Business Database Concepts. (3)*fall and spring*

Database theory, design, and application, including the entity-relationship model; the relational, hierarchical, and network database models; and query languages. Prerequisite: professional program business student majoring in Computer Information Systems or Accountancy. Prerequisites with a grade of "C" or higher: ACC 330; CIS 335.

CIS 430 Networks and Distributed Systems. (3)*fall and spring*

Advanced topics such as communications protocols, distributed systems, and client-server systems; applications based on platforms such as networked UNIX. Prerequisites: CIS 410; professional program business student majoring in Computer Information Systems.

CIS 440 Systems Design and Electronic Commerce. (3)*fall and spring*

Systems design for organizational and electronic commerce systems; use of project management and systems analysis and design tools. Prerequisites: professional program business student majoring in Computer Information Systems. Prerequisites with a grade of "C" or higher: CIS 410, 420. Pre- or corequisite with a grade of "C" or higher: CIS 430.

General Studies: L

CIS 494 Special Topics. (1–4)*not regularly offered***CIS 502 Management Information and Decision Support Systems. (3)***once a year*

Fundamentals of computer-based management information and decision support systems. Prerequisite: M.B.A. degree program student.

CIS 505 Object-Oriented Modeling and Programming. (3)*once a year*

Object-oriented modeling of business information systems, abstract data types and object-oriented programming using a visual language. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 506 Business Database Systems. (3)*once a year*

Hierarchical, network, relational, and other recent data models for database systems. Processing issues such as concurrency control, query optimization, and distributed processing. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 512 Intelligent Decision Systems and Knowledge Management. (3)*once a year*

Definition, description, construction, and evaluation of computer-based decision systems. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 515 Management Information Systems. (3)*not regularly offered*

Systems theory concepts applied to the collection, retention, and dissemination of information for management decision making. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CIS 520 Systems Design and Evaluation. (3)*not regularly offered*

Methodologies of systems analysis and design. Issues include project management, interface, organizational requirements, constraints, documentation, implementation, control, and performance evaluation. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 530 Information Systems Development. (3)*once a year*

Object-oriented and interprocess communication and control concepts for information systems; applications based on languages such as C++ and platforms such as networked UNIX. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 535 Distributed Information Systems. (3)*once a year*

Distributed systems and their impact on information systems in business. Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 591 Seminar on Selected CIS Topics. (1–12)*once a year*

Possible topics:

- (a) Computer Security
- (b) Computing Architectures
- (c) Data Warehouse and Data Mining
- (d) Electronic Commerce
- (e) Enterprise Modeling

Prerequisite: M.S. in Information Management degree program student or M.A.I.S. degree program student.

CIS 593 Applied Project. (1–12)*not regularly offered*

Department of Economics

Arthur E. Blakemore

Chair

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www.cob.asu.edu/ecn

PROFESSORS

BLAKEMORE, BOYES, BRADA, BURDICK, BURGESS,
DeSERPA, FAITH, GOODING, HAPPEL, HOFFMAN,
HOGAN, KINGSTON, LOW, MANELLI, MAYER,
McDOWELL, McPHERTERS, MELVIN, MÉNDEZ,
ORMISTON, SANTOS, SCHLEE

ASSOCIATE PROFESSORS

AHN, COGLEY, REFFETT, REISER, WILSON, WINKELMAN

ASSISTANT PROFESSORS

CHADE, DATTA, HENDRICKS

SENIOR LECTURER

ROBERTS

The study of economics can give students a general knowledge of the ways goods and services are allocated and incomes generated; economics can help students understand why prices, employment, money, and financial markets behave as they do. Some knowledge of economics is crucial not only for students of business but for students pursuing graduate education in law or careers in journalism and communications.

Economists obtain positions at universities and in government, financial institutions, brokerage houses, private nonfinancial corporations, international organizations such as the International Monetary Fund and the World Bank, as financial journalists, and as marketing and management specialists in domestic and international firms.

ECONOMICS—B.S.

Economics majors are required to earn a minimum grade of “C” in MAT 210 Brief Calculus before taking upper-division courses in economics. While MAT 210 meets the minimum mathematics requirement to major in Economics, all Economics majors who anticipate going on to graduate school in economics or in business or to law school are encouraged to take MAT 270 Calculus with Analytic Geometry I. Majors are encouraged to pursue further course work in mathematics. MAT 270 may be taken in lieu of MAT 210.

The major in Economics consists of 18 semester hours of upper-division courses in economics. The following six hours must be included:

ECN 313 Intermediate Macroeconomic Theory <i>SB</i>	3
ECN 314 Intermediate Microeconomic Theory <i>SB</i>	3

ECN 313 and 314 should be taken before other upper-division courses in economics. Students must earn a minimum grade of “C” in ECN 313 and 314. Concurrent enrollment in ECN 313 and 314 is permitted. Concurrent enrollment in ECN 313 or 314 and other upper-division courses in economics is subject to the approval of the faculty advisor.

MAJOR PROFICIENCY REQUIREMENTS

Students must receive grades of “C” or higher in upper-division courses for the major. If a student receives a grade below “C” in any course in the major, this course must be repeated. If a second grade below “C” is received in either an upper-division course in the major already taken or in a different upper-division course in the major, the student is no longer eligible to take additional upper-division courses in the major.

Other Economics Programs. For information on majoring in Economics in the College of Liberal Arts and Sciences, see “Economics,” page 353.

For information on the minor in General Economics and on the minor in Economics for Students Planning a Career in Law, see “Minor in Economics for Students Planning a Career in Law,” page 353.

GRADUATION REQUIREMENTS

In addition to fulfilling major requirements, students seeking a degree must meet all university and college requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 152.

ECONOMICS (ECN)

ECN 111 Macroeconomic Principles. (3)

fall, spring, summer

Basic macroeconomic analysis. Economic institutions and factors determining income levels, price levels, and employment levels.

General Studies: SB

ECN 112 Microeconomic Principles. (3)*fall and spring*

Basic microeconomic analysis. Theory of exchange and production, including the theory of the firm.

*General Studies: SB***ECN 306 Survey of International Economics. (3)***fall and spring*

Survey of international trade issues, commercial policy, trade theory, customs unions, and international monetary topics. Not for Economics majors. Lecture, discussion. Cross-listed as IBS 306. Credit is allowed for only ECN 306 or IBS 306. Prerequisites: ECN 111 (or 112); 2.00 ASU GPA; junior standing.

*General Studies: SB, G***ECN 313 Intermediate Macroeconomic Theory. (3)***fall and spring*

Determinants of aggregate levels of employment, output, and income of an economy. Prerequisites: ECN 111, 112. Prerequisite with a grade of "C" or higher: MAT 210.

*General Studies: SB***ECN 314 Intermediate Microeconomic Theory. (3)***fall and spring*

Role of the price system in organizing economic activity under varying degrees of competition. Prerequisites: ECN 111, 112. Prerequisite with a grade of "C" or higher: MAT 210.

*General Studies: SB***ECN 315 Money and Banking. (3)***summer*

Functions of money. Monetary systems, credit functions, banking practices, and central banking policy. Cannot be applied to the Economics major. Prerequisite: ECN 111.

ECN 331 Comparative Economic Systems. (3)*not regularly offered*

Alternative institutions, past and present, for organizing the social division of labor. Property rights, information, and incentives in industrial societies. Prerequisite: ECN 111 or 112.

*General Studies: SB, G***ECN 360 Economic Development. (3)***not regularly offered*

Theories of economic growth and development. Role of capital formation, technological innovation, population, and resource development in economic growth. Prerequisite: ECN 111 or 112.

*General Studies: SB, G***ECN 365 Economics of Russia and Eastern Europe. (3)***once a year*

Origins and analysis of contemporary institutions. Comparative development and differentiation in the 20th century. Prerequisite: ECN 111 or 112.

*General Studies: SB, G***ECN 382 Managerial Economics. (3)***once a year*

Application of economic analysis to managerial decision making. Market analysis in the context of the socio-legal environment. Not for Economics majors. Lecture, discussion. Prerequisites: ECN 111, 112; 2.00 ASU GPA; junior standing.

ECN 384 Economics of Social Behavior. (3)*once a year*

Application of economic analysis to contemporary behavior: discrimination, work versus leisure, crime, medical care, macroeconomic policies. Not for Economics majors. Lecture, student participation.

Prerequisites: 2.00 ASU GPA; junior standing.

*General Studies: L/SB***ECN 394 Special Topics. (3)***not regularly offered*Current topics of domestic or international interest. Analytical emphasis may be macro, micro, or both. See current *Schedule of Classes* for offerings. Not for Economics majors. Prerequisite: ECN 111 or 112.**ECN 404 History of Economic Thought. (3)***not regularly offered*

Development of economic doctrines, theories of mercantilism, physiocracy, classicism, neoclassicism, Marxism, and contemporary economics. Prerequisite: ECN 314 or instructor approval.

*General Studies: L/SB***ECN 421 Earnings and Employment. (3)***once a year*

Analysis of earnings, employment, unemployment, training, education, and related topics. Policy issues are emphasized. Prerequisite: ECN 314 or instructor approval.

*General Studies: L/SB***ECN 436 International Trade Theory. (3)***once a year*

Comparative-advantage doctrine, including practices under varying commercial policy approaches. Economic impact of international disequilibrium. Prerequisite: ECN 314 or instructor approval.

*General Studies: SB, G***ECN 438 International Monetary Economics. (3)***once a year*

History, theory, and policy of international monetary economics. Balance of payments and exchange rates. International financial markets including Eurocurrency markets. Prerequisite: ECN 313 or instructor approval.

*General Studies: SB, G***ECN 441 Public Finance. (3)***once a year*

Public goods, externalities, voting models, public expenditures, taxation, and budget formation with emphasis on the federal government. Prerequisite: ECN 314 or instructor approval.

*General Studies: L/SB***ECN 450 Law and Economics. (3)***once a year*

Economics of the legal system including analysis of property, contracts, torts, commercial law, and other topics. Discussion, analysis. Prerequisite: ECN 314.

*General Studies: L***ECN 453 Government and Business. (3)***once a year*

Development of public policies toward business. Antitrust activity. Economic effects of government policies. Prerequisite: ECN 314 or instructor approval.

ECN 480 Introduction to Econometrics. (3)*once a year*

Elements of regression analysis: estimation, hypothesis tests, prediction. Emphasizes use of econometric results in assessment of economic theories. Prerequisite: instructor approval.

*General Studies: CS***ECN 484 Economics Internship. (3)***fall, spring, summer*

Academic credit for professional work organized through the internship program. Prerequisites: ECN 313, 314; outstanding academic record.

ECN 485 Mathematical Economics. (3)*once a year*

Integrates economic analysis and mathematical methods into a comprehensive body of knowledge within contemporary economic theory. Prerequisite: instructor approval.

ECN 493 Honors Thesis. (3)*not regularly offered**General Studies: L***ECN 494 Special Topics. (1–4)***not regularly offered*Current economic topics of domestic or international interest. Analytical emphasis may be macro, micro, or both. See current *Schedule of Classes* for offerings. Prerequisites: both ECN 313 and 314 or only instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ECN 498 Pro-Seminar. (3)*once a year*

Topic chosen from current area of interest. Prerequisites: both ECN 313 and 314 or only instructor approval.

ECN 502 Managerial Economics. (3)*fall and spring*

Application of microeconomic analysis to managerial decision making in areas of demand, production, cost, and pricing. Evaluation of competitive strategies. Prerequisite: M.B.A. degree program student.

ECN 503 Global Economics for Managers. (3)*fall and spring*

Macroeconomic analysis of issues related to economic growth, inflation, interest rates behavior, unemployment, exchange rate determination, and global competitiveness. Prerequisite: M.B.A. degree program student.

ECN 504 History of Economic Thought. (3)*spring*

Historical development of economic theory. Emphasis on the development of economic analysis from preclassical economics through Keynes. Prerequisite: ECN 510 or instructor approval.

ECN 509 Macroeconomic Theory and Applications. (3)*fall*

Theory of income, output, employment, and price level. Influence on business and economic environment. Prerequisites: both ECN 111 and calculus or only instructor approval.

ECN 510 Microeconomic Theory and Applications. (3)*fall*

Application of economic theory to production, consumer demand, exchange, and pricing in a market economy. Prerequisites: both ECN 112 and calculus or only instructor approval.

ECN 511 Macroeconomic Analysis I. (3)*fall*

Current theories of output, employment, inflation, and asset prices as well as major aggregates. Introduction to dynamic optimization techniques. Prerequisites: both ECN 313 and calculus or only instructor approval.

ECN 512 Microeconomic Analysis I. (3)*fall*

Theory of production, consumer demand, resource use, and pricing in a market economy. Prerequisites: both ECN 314 and calculus or only instructor approval.

ECN 513 Macroeconomic Analysis II. (3)*fall*

Focuses on growth theory, dynamic general equilibrium models, monetary theory, open-economy issues. Prerequisite: ECN 511 or instructor approval.

ECN 514 Microeconomic Analysis II. (3)*spring*

General equilibrium, welfare economics, production, and capital theory. Prerequisite: ECN 512 or instructor approval.

ECN 515 Advanced Macroeconomic Analysis. (3)*fall*

Focuses on current research areas in macroeconomics and monetary theory with emphasis on methods in economic dynamics and numerical techniques. Prerequisite: ECN 511 or instructor approval.

ECN 516 Economics of Uncertainty, Information, and Strategic Behavior. (3)*fall*

Economic behavior under uncertainty; markets and contracts under asymmetric information; the theory of games with incomplete information and applications. Prerequisite: ECN 512 or instructor approval.

ECN 517 Monetary Theory. (3)*fall*

Traditional and post-Keynesian monetary theory, interest rate determination, the demand and supply of money. Prerequisite: ECN 511 or instructor approval.

ECN 521 Labor Economics I. (3)*spring*

Development of basic theoretical models for analyzing labor market issues. Prerequisite: ECN 510 or instructor approval.

ECN 522 Labor Economics II. (3)*not regularly offered*

Extensions/criticisms of labor market theories. Applications to a variety of policy issues. Prerequisite: ECN 521.

ECN 525 Econometrics I. (3)*spring*

Problems in the formulation of econometric models. Emphasizes estimation, hypothesis testing, and forecast of general linear models. Prerequisite: 6 hours in statistics or instructor approval.

ECN 526 Econometrics II. (3)*fall*

Estimation and inference of qualitative and limited dependent variable models as well as general multiple equation models. Prerequisite: ECN 525 or instructor approval.

ECN 527 Econometrics III. (3)*spring*

Generalized method of moment estimation, estimation with censored and truncated samples, nonlinear models, panel-data models, econometrics of nonstationarities. Prerequisite: ECN 526 or instructor approval.

ECN 531 Comparative Economic Systems. (3)*fall*

Philosophical foundations of major economic systems and of properties of principal system models. Comparison of alternative institutions and system components of contemporary economies. Prerequisites: both ECN 509 and 510 or only instructor approval.

ECN 536 International Trade Theory. (3)*spring*

Theories of comparative advantage and their empirical verification. Theory and political economy of commercial policy. Resource transfers and the role of the multinational corporation. Prerequisites: both ECN 509 and 510 or only instructor approval.

ECN 538 International Monetary Theory and Policy. (3)*fall*

Foreign exchange market, balance of payments, and international financial institutions and arrangements; theory and applications. Prerequisites: both ECN 509 and 510 or only instructor approval.

ECN 541 Public Economics. (3)*fall*

Economics of collective action, public spending, taxation, and politics. Impact of central governmental activity on resource allocation and income distribution. Prerequisite: ECN 510 or instructor approval.

ECN 553 Industrial Organization. (3)*spring*

Analysis of structure, conduct, and performance in industrial markets; the economics of organizations. Prerequisite: ECN 510 or instructor approval.

ECN 560 Economics of Growth and Development. (3)*fall*

Economic problems, issues, and policy decisions facing the developing nations of the world. Prerequisites: both ECN 509 and 510 or only instructor approval.

ECN 584 Economics Internship. (1–3)*summer*

Academic credit for professional work organized through the internship program. Prerequisites: both ECN 510 and 511 or only instructor approval.

ECN 585 Mathematics for Economists. (3)*fall*

Survey of mathematical ideas encountered in economics and econometrics: nonlinear programming, the Kuhn-Tucker theorem, concave programming, optimization over time. Prerequisite: calculus or instructor approval.

ECN 591 Economics Seminar. (1–3)*fall, spring, summer*

Presentations by outside speakers, department faculty, and graduate students of work in progress. Prerequisite: instructor approval.

ECN 593 Applied Projects. (3)*fall*

Preparation of a supervised applied project typically in conjunction with an internship. Prerequisites: ECN 510, 511.

ECN 594 Conference and Workshop in Economics. (1–12)*fall*

Workshops offered include: economic analysis, microeconomic analysis, macroeconomics.

ECN 598 Special Topics. (3)*not regularly offered*Advanced topics in economics. Consult the *Schedule of Classes* for offerings. Prerequisite: instructor approval.**QUANTITATIVE BUSINESS ANALYSIS (QBA)***For more QBA courses, see "Department of Management."***QBA 221 Statistical Analysis. (3)***fall and spring*

Methods of statistical description. Applies probability theory and statistical inference in business. Prerequisite: MAT 119.

*General Studies: CS***QBA 321 Applied Quality Analysis I. (3)***once a year*

Applies statistical tools employed in empirical studies related to quality analysis. Applications focus on service processes. Prerequisite: QBA 221.

*General Studies: L***QBA 410 Applied Business Forecasting. (3)***not regularly offered*

Applies forecasting techniques in business and institutional environments. Prerequisite: QBA 321.

QBA 421 Applied Quality Analysis II. (3)*once a year*

Applies statistical tools employed in manufacturing and experimental research. Applications focus on design and improvement of processes. Prerequisite: QBA 321.

QBA 502 Managerial Decision Analysis. (3)*fall and spring*

Fundamentals of quantitative analysis to aid management decision making under uncertainty. Prerequisites: MAT 210; computer literacy; graduate degree program student.

QBA 525 Applied Regression Models. (3)*once a year*

Simple linear regression, multiple regression, indicator variables, and logistic regression. Emphasis on business and economic applications. Prerequisite: MAT 210.

QBA 527 Categorical Data Analysis. (3)*once a year*

Discrete data analysis in business research. Multidimensional contingency tables and other discrete models. Prerequisite: QBA 525.

QBA 530 Experimental Design. (3)*once a year*

Experimental designs used in business research. Balanced and unbalanced factorial designs, repeated measures designs, and multivariate analysis of variance. Prerequisite: QBA 525 (or its equivalent).

QBA 535 Multivariate Methods. (3)*once a year*

Advanced statistical methods used in business research. Multivariate analysis of association and interdependence. Prerequisite: QBA 525.

QBA 540 Forecasting. (3)*not regularly offered*

Foundation of statistical forecasts and forecast intervals; applies classical and computer-assisted forecasting methods to business forecasting problems. Prerequisites: MAT 210; QBA 502.

QBA 593 Applied Project. (1–12)*not regularly offered***QBA 599 Thesis. (1–12)***not regularly offered*

Department of Finance**Herbert M. Kaufman***Chair***(BAC 519) 480/965-3131****Fax 480/965-8539****www.cob.asu.edu/fin**

PROFESSORS

BOOTH, COLES, KAUFMAN, POE, SUSHKA

ASSOCIATE PROFESSORS

CESTA, GALLINGER, HERTZEL, HOFFMEISTER, WILT

ASSISTANT PROFESSORS

CAMPELLO, GRIFFIN, MARTIN, NARDARI, PERRY

FINANCE—B.S.

The study of finance prepares students to understand the financial implications inherent in virtually all business decisions. Students majoring in Finance are prepared for entry-level careers in corporate management, depository institutions, investment management, and financial services. The finance curriculum emphasizes financial markets, evaluation of investments, and efficient allocation of resources. The major in Finance consists of the following courses:

ACC 315 Financial Accounting and Reporting	3
FIN 331 Financial Markets and Institutions	3
FIN 361 Managerial Finance	3
FIN 421 Security Analysis and Portfolio Management	3
FIN 461 Financial Cases and Modeling L	3
One additional 400-level FIN course	3
<hr/>	<hr/>
Total	18

As part of the requirements, all Finance majors must complete ACC 250 Introductory Accounting Lab. Finance majors are strongly advised to take ACC 316 Management Uses of Accounting. FIN 484 Finance Internship is available for nonmajor elective credit.

ACC 250 must be completed before taking ACC 315. FIN 331 and 361 and ACC 315 must be completed before taking 400-level FIN courses.

MAJOR PROFICIENCY REQUIREMENTS

Students must receive grades of "C" or higher in upper-division courses for the major. If a student receives a grade below "C" in any course in the major, this course must be repeated before taking any further courses for which this course is a prerequisite. If a second grade below "C" is received in either an upper-division course in the major already taken or in a different upper-division course in the major, the student is no longer eligible to take additional upper-division courses in that major.

GRADUATION REQUIREMENTS

In addition to fulfilling major requirements, students seeking a degree must meet all university and college requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 152.

FINANCE (FIN)

FIN 300 Fundamentals of Finance. (3)

fall, spring, summer

Theory and problems in financial management of business enterprises. Prerequisites: ACC 240; ECN 112; QBA 221.

FIN 331 Financial Markets and Institutions. (3)

fall and spring

Analysis of financial markets and intermediaries. Theory of financial intermediation, interest rate theory, money and capital market instruments, and government regulation. Prerequisite: professional program business student majoring in Finance. Prerequisite with a grade of “C” or higher: FIN 300.

FIN 361 Managerial Finance. (3)

fall and spring

Theories and problems in resource allocation, cost of capital, CAPM and capital budgeting, asset valuation, capital structure, and financing policy. Prerequisite: professional program business student majoring in Finance. Prerequisite with a grade of “C” or higher: FIN 300.

FIN 380 Personal Financial Management. (3)

fall and spring

Dynamic analysis of personal financial planning, including time value of money, stock and bond investment, and retirement and estate planning. Prerequisites: minimum cumulative GPA of 2.00; junior standing; non-Finance major.

FIN 394 Special Topics. (1–4)

not regularly offered

FIN 421 Security Analysis and Portfolio Management. (3)

fall and spring

Security analysis theory and practice. Selection and management of financial asset portfolios. Securities markets and portfolio risk-return analysis. Lecture, discussion. Prerequisite: professional program business student majoring in Finance. Prerequisites with a grade of “C” or higher: ACC 315; FIN 331, 361.

FIN 427 Derivative Financial Securities. (3)

once a year

Study of stock options, index options, convertible securities, financial futures, warrants, subscription rights, and arbitrage pricing theory. Lecture, discussion. Prerequisite: professional program business student majoring in Finance. Prerequisite with a grade of “C” or higher: FIN 421.

FIN 431 Management of Financial Institutions. (3)

once a year

Asset/liability and capital management in financial institutions. Influence of market factors and regulatory agencies. Emphasis on commercial banks. Lecture, discussion. Prerequisite: professional program business student majoring in Finance. Prerequisites with a grade of “C” or higher: ACC 315; FIN 331, 361.

FIN 451 Working Capital Management. (3)

not regularly offered

Analysis of short-term profitability and liquidity. Emphasis on managing cash, accounts receivable, inventory, and current liabilities. Lecture, discussion. Prerequisite: professional program business student. Prerequisites with a grade of “C” or higher: ACC 315; FIN 331, 361.

FIN 456 International Financial Management. (3)

once a year

Exchange rate determination, financial markets, managing multinational corporations, capital budgeting, and hedging currency risk exposure from an international perspective. Prerequisite: professional program business student majoring in Finance. Prerequisites with a grade of “C” or higher: ACC 315; FIN 331, 361.

General Studies: G

FIN 461 Financial Cases and Modeling. (3)

once a year

Case-oriented capstone course in managerial finance. Contemporary issues of liquidity management, capital budgeting, capital structure, and financial strategy. Lecture, discussion, group work. Prerequisite: professional program business student majoring in Finance. Prerequisites with a grade of “C” or higher: ACC 315; FIN 331, 361.

General Studies: L

FIN 481 Honors Seminar in Finance. (3)

once a year

Honors course covering topics that include theory and applications concerning managerial finance, investments, and financial institutions. Lecture, discussion. Prerequisite: Finance College of Business honors program student. Prerequisites with a grade of “C” or higher: ACC 315; FIN 331, 361.

FIN 484 Finance Internship. (3)

fall, spring, summer

Academic credit for field work in finance organized through the internship program. Prerequisites: FIN 331, 361; strong academic record; instructor approval.

FIN 494 Special Topics. (1–4)

not regularly offered

FIN 502 Managerial Finance. (3)

once a year

Theory and practice of financial decision making, including risk analysis, valuation, capital budgeting, cost of capital, and working capital management. Prerequisites: ACC 502; ECN 502; QBA 502.

FIN 521 Investment Management. (3)

once a year

Valuation of equities, fixed incomes, and options/financial futures in an individual security and portfolio context; mathematical asset allocation approaches. Lecture, discussion. Prerequisite: FIN 502.

FIN 527 Derivative Financial Securities. (3)

once a year

Analysis of forwards, futures, and option contracts on bonds, commodities, equities, and foreign exchange. Design of speculative and hedging strategies. Lecture, discussion. Prerequisites: FIN 502, 521.

FIN 531 Capital Markets and Institutions. (3)

once a year

Recent theoretical and operational developments in economic sectors affecting capital markets and institutions. Lecture, discussion. Prerequisite: FIN 502.

FIN 551 Financial Statement Analysis. (3)

once a year

Analysis of corporations’ financial statements to ascertain their financial strength and default risk. Emphasis on studying cash flows. Lecture, cases. Prerequisites: ACC 502; FIN 502.

FIN 556 International Financial Management. (3)

once a year

Behavior of real and nominal currency exchange rates, management of international investment portfolios, corporate exchange exposure, and hedging exchange risk. Lecture, discussion. Prerequisite: FIN 502.

FIN 561 Financial Management Cases. (3)

once a year

Case-oriented course in applications of finance theory to management issues. Acquisition, allocation, and management of funds within the business enterprise. Working capital management, capital budgeting, capital structure, and financial strategy. Lecture, discussion, presentation. Prerequisite: FIN 502.

FIN 581 Applied Corporate Finance. (3)

once a year

Applies theories in corporate finance. Market efficiency, capital structure, “principal-agent” theory, corporate control, dividend policy, and capital budgeting. Prerequisite: FIN 502.

FIN 781 Theory of Finance. (3)

once a year

Fundamental tools of financial economics; asset pricing, arbitrage, option pricing, capital structure, dividend policy, asymmetric information, and transaction-cost economics. Prerequisites: FIN 502, 521, 531.

FIN 791 Doctoral Seminar in Finance. (1–12)

once a year

Possible topics:

- (a) Financial Institutions and Markets. (3)
Economic and monetary theory applied to financial markets and institutions; implications of financial structure for market performance and efficiency.
- (b) Financial Management. (3)
Financial theory pertaining to capital structure, dividend policy, valuation, cost of capital, and capital budgeting.
- (c) Investments. (3)
Investments and market theory; efficient markets hypothesis; option and commodity markets.

Prerequisite: FIN 781.

**School of Health Administration
and Policy**

Eugene S. Schneller
Director
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PROFESSORS

FORSYTH, JOHNSON, KIRKMAN-LIFF,
SCHNELLER, WILLIAMS

ASSISTANT PROFESSOR
RIVERS

While the school does not offer an undergraduate major, a number of courses at the 200 and 400 levels are available to students who have a strong interest in health care, public health, and health policy. Students may enroll in these courses regardless of their undergraduate major. Registration for courses at the 400 level is with permission of the instructor and due to seat availability.

Students have the opportunity to enhance their skills by completing courses in one of the M.B.A. specializations, including information management, supply chain management, finance, or service marketing. Additional courses available in the program include:

HSA 560 Health Services Administration and Policy	3
HSA 561 Biostatistics	3
HSA 562 Health Care Organization and Systems	3
HSA 563 Health Care Economics.....	3
HSA 564 Health Care Finance.....	3
HSA 565 Policy Issues in Health Care	3
HSA 598 ST: Epidemiology	3

For more information, see the *Graduate Catalog*.

HEALTH SERVICES ADMINISTRATION (HSA)

HSA 220 Health Care Organizations. (3)

fall and spring

Overview of United States health care delivery systems; financing, health policy, basic principles of budgeting, cost-benefit analysis, and resource management. Cross-listed as HCR 220. Credit is allowed for only HCR 220 or HSA 220. Prerequisites: ENG 101 (or 105), 102. *General Studies: L*

HSA 473 Comparative Health Systems. (3)

not regularly offered

Comparison of health care financing and delivery in industrialized countries; covers insurance, hospital management and physician payment. Lecture, discussion.

HSA 498 Pro-Seminar. (1–7)

not regularly offered

Possible topics:

- (a) Health Care Finance. (3)
- (b) Health Economics. (3)
- (c) Health Service Administration and Policy. (3)
- (d) Policy Issues in Health Care. (3)

HSA 502 Health Care Organization. (3)

once a year

Concepts, structures, functions, and values which characterize contemporary health care systems in the United States.

HSA 505 Community Health Care Perspectives. (3)

once a year

Epidemiological, sociological and political perspectives, and techniques for analyzing health problems and responding to health care needs in communities. Prerequisite: HSA 502.

HSA 512 Health Care Economics. (3)

once a year

Economics of production and distribution of health care services, with special emphasis on the impact of regulation, competition, and economic incentives. Prerequisite: HSA 502.

HSA 520 Health Care Organizational Structure and Policy. (3)

once a year

Functional relationships among managerial elements of health care institutions with major focus on hospital governance and policy dynamics. Prerequisite: HSA 502.

HSA 522 Health Care Management Systems. (3)

once a year

Systems concepts, quantitative methods, and information systems applied to management problems in health institutions and community health planning. Prerequisites: HSA 505; QBA 502.

HSA 532 Financial Management of Health Services. (3)

once a year

Acquisition, allocation, and management of financial resources within the health care enterprise. Budgeting, cost analysis, financial planning, and internal controls. Prerequisites: ACC 503; FIN 502; HSA 502.

HSA 540 Health Care Outcomes. (3)

once a year

Project-oriented course on application of efficiency-based methods for the evaluation of the outcomes of health care. Seminar, individual student research. Prerequisite: HSA 512 or enrollment in Ph.D. program.

HSA 542 Health Care Jurisprudence. (3)

once a year

Legal aspects of health care delivery for hospital and health services administration. Legal responsibilities of the hospital administrator and staff. Prerequisites: HSA 505, 520.

HSA 560 Health Services Administration and Policy. (3)

fall and spring

Introduction to organizational theory and management of complex organizations within the historical and contemporary contexts of the U.S. public health.

HSA 561 Biostatistics. (3)

fall

Aspects of descriptive statistics and statistical inference most relevant to health issues, including data, rates, and confidence intervals.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HSA 562 Health Care Organization and Systems. (3)*once a year*

Functional relationships among managerial elements of health care institutions with major focus on hospital governance and policy dynamics.

HSA 563 Health Care Economics. (3)*fall*

Introduction to concepts and methods used to direct and understand production and distribution of health care services.

HSA 564 Health Care Finance. (3)*once a year*

Overview of the acquisition, allocation, and management of financial resources by health care providers. Focuses on economic, financial, and accounting principles.

HSA 565 Policy Issues in Health Care. (3)*once a year*

Current policy issues in health through concepts of access, cost, and quality; issues relating to disease trends and policy formulation.

HSA 566 Basic Principles of Epidemiology. (3)*spring*

Basic principles of epidemiology, evaluation of etiology, natural history, intervention therapy, and disease prevention. Lecture, lab. Prerequisite: Master of Public Health major or instructor approval.

HSA 571 Managed Care. (3)*not regularly offered*

Trends in managed care/integrated systems, complexities of balancing objectives (e.g., financial and quality). A two-semester-long marketplace simulation. Prerequisite: HSA 502.

HSA 573 Comparative Health Systems. (3)*once a year*

Comparison of health care financing and delivery in industrialized countries; covers insurance, hospital management, and physician payment. Lecture, discussion.

HSA 575 Chronic Care Administration. (3)*not regularly offered*

Management of long-term care services and facilities, including behavioral health and rehabilitation programs.

HSA 589 Integrative Seminar. (3)*fall, spring, summer*

Capstone assessment of current policies, problems, and controversies across the broad spectrum of health services administration. Prerequisites: HSA 505, 520, 522, 532.

HSA 591 Seminar. (1–12)*once a year*

Possible topics:

- (a) Behavioral Health. (3)
- (b) Cost Containment and Quality Assurance. (3)
- (c) Health Care Economic Outcomes. (3)
- (d) Health Care Policy. (3)
- (e) Managing Physicians. (3)
- (f) Topics in Health Services Research. (3)

HSA 593 Applied Project. (3)*fall, spring, summer*

Optional on-site experience in advanced development of managerial skills in health services administration and policy. Minimum of 10 weeks. Prerequisites: 18 hours of credit toward program of study; director approval.

HSA 598 Special Topics. (1–4)*once a year*

Possible topics:

- (a) Epidemiology. (3)

International Business Studies

Josef C. Brada

*Director***(BAC 689) 480/965-6524****www.cob.asu.edu/up/ipo.cfm**

Adela Gasca

*Coordinator***(BA 122) 480/965-4066 or -0596****www.cob.asu.edu/up/ipo.cfm**

Certificate in International Business Studies

The program of study leading to the Certificate in International Business Studies is designed to prepare students for positions with multinational firms, banks, government agencies, and international organizations. This program is not a substitute for the listed areas of business specialization; rather, the courses required for the certificate add an international dimension to the student's chosen major.

Requirements for the certificate are designed to provide an understanding of international business environments, principles and operations; to provide an awareness of global social processes and a sensitivity to foreign cultures; and to develop competence in a foreign language. These objectives are met in the following ways: international business principles and operations, global and area studies, foreign language, and GPA proficiency.

International Business Principles and Operations. At least 15 semester hours of approved courses in international business are required. Students must take either IBS 300 Principles of International Business or ECN/IBS 306 Survey of International Economics and the international course in their major. Other international business courses from which the remaining hours are selected include

ECN 306	Survey of International Economics <i>SB, G*</i>	3
	or IBS 306 Survey of International Economics <i>SB, G*</i> (3)	
ECN 331	Comparative Economic Systems <i>SB, G*</i>	3
ECN 360	Economic Development <i>SB, G*</i>	3
ECN 365	Economics of Russia and Eastern Europe <i>SB, G*</i>	3
ECN 436	International Trade Theory <i>SB, G*</i>	3
ECN 438	International Monetary Economics <i>SB, G*</i>	3
FIN 456	International Financial Management <i>G*</i>	3
IBS 300	Principles of International Business <i>G*</i>	3
IBS 394	ST: Economics of Latin America	3
IBS 394	ST: Regional Business Environment of Southeast Asia	3
	or IBS 494 ST: Regional Business Environment of Southeast Asia (3)	
IBS 400	Cultural Factors in International Business <i>C, G*</i>	3
	or MGT 494 ST: Cultural Factors in International Business (3)	
IBS 484	International Business Internship	3
IBS 493	International Honors Thesis <i>L*</i>	3
IBS 499	Individualized Instruction of International Business	3
MGT 459	International Management	3
	or IBS 494 ST: International Management (3)	
MGT 494	ST: Applied International Management	3
MKT 394	ST: Global Markets	3
MKT 435	International Marketing	3

MKT 494 ST: Applied International Marketing	1-4
SCM 463 Global Supply Chain Management	3

* College of Business students may not use this course to fulfill the 60 semester hours in college degree requirements.

Honors students who select an international topic for their thesis may use that as part of the 15 hours of international course work for the certificate.

Global and Area Studies. This requirement can be satisfied either by means of course work or through participation in approved College of Business exchange programs with foreign schools of business, or by some combination of the two. The course work option requires at least 12 semester hours of approved electives in international and area studies. A minimum of six semester hours must be in courses that provide a cross-cultural perspective from the global point of view of one or more disciplines. A minimum of six semester hours must be in courses that provide an understanding of one region of the world.

The College of Business has exchange agreements with universities in Mexico, Spain, the United Kingdom, France, Italy, and Chile. Students who participate in an approved College of Business exchange program with a foreign business school for two semesters are deemed to have fulfilled the global and area studies requirements of the Certificate in International Business upon the successful completion of this exchange program. Students who participate in such an exchange program for one semester are deemed to have satisfied the required six hours of area studies courses. Students who participate in a business seminar need to complete only three hours of area studies courses to meet the requirements of the certificate.

Foreign Language. Evidence of competence in a foreign language equivalent to one year of college study is required.

Additional Requirements. Applicants for the Certificate in International Business must earn a "C" or higher in each of the courses selected for the certificate, have at least a 2.50 GPA for all course work applied to the certificate, and complete at least 50 percent of the course work at ASU Main.

Advising. When planning and selecting courses to meet the requirements for the certificate and to take advantage of opportunities for participation in exchanges with foreign schools of business, students should consult with an international business faculty advisor or the coordinator of international programs, in BA 122. For more information, call 480/965-4066, or access the Web site at www.cob.asu.edu/ipo.cfm.

INTERNATIONAL BUSINESS STUDIES (IBS)

IBS 300 Principles of International Business. (3)

fall, spring, summer

Multidisciplinary analysis of international economic and financial environment. Operations of multinational firms and their interaction with home and host societies. Prerequisite: ECN 112.

General Studies: G

IBS 306 Survey of International Economics. (3)

fall and spring

Survey of international trade issues, commercial policy, trade theory, customs unions, and international monetary topics. Not for Economics majors. Lecture, discussion. Cross-listed as ECN 306. Credit is allowed for only ECN 306 or IBS 306. Prerequisites: ECN 111 (or 112); 2.00 ASU GPA; junior standing.

General Studies: SB, G

IBS 394 Special Topics. (1-4)

fall and spring

Possible topics:

- (a) Economics of Latin America. (3)
- (b) Regional Business Environment of Southeast Asia. (3)

Prerequisites: 2.00 ASU GPA; junior standing.

IBS 400 Cultural Factors in International Business. (3)

fall, spring, summer

Cultural role in international business relations; applied principles of cross-cultural communications, negotiations, and management; regional approaches to business relations. Prerequisites: IBS 300, 306 (or ECN 306).

General Studies: C, G

IBS 484 International Business Internship. (3)

not regularly offered

Academic credit for professional work organized through the internship/international program. Prerequisites: IBS 300 or 306 (or ECN 306); professional program business student; senior; minimum cumulative ASU GPA of 3.40; minimum ASU business GPA of 3.40.

IBS 493 International Honors Thesis. (3)

fall and spring

General Studies: L

IBS 494 Special Topics. (1-4)

fall and spring

Possible topics:

- (a) International Management. (3)
Prerequisite: IBS 300 or MGT 301.
- (b) Multinational Management. (3)
- (c) Regional Business Environment of Southeast Asia. (3)

Credit is allowed for only IBS 494 ST: International Management or IBS 494 ST: Multinational Management or MGT 459.

IBS 499 Individualized Instruction in International Business. (3)

fall and spring



ASU offers ample computer lab resources for students.

Doug Crouch photo

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Department of Management

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PROFESSORS

ASHFORTH, BOHLANDER, CARDY, DOOLEY,
 GLICK, GOMEZ-MEJIA, HERSHAUER, HITT, HOM,
 KINICKI, KULIK, OSTROFF, PENLEY,
 REIF, V. SMITH-DANIELS

ASSOCIATE PROFESSORS

BOYD, BRENNSTUHL, CALLARMAN, CHOI, COOK,
 KEATS, KELLER, MOORHEAD, OLIVAS, ROBERSON,
 D. SMITH-DANIELS, VAN HOOK

ASSISTANT PROFESSORS

BLANCERO, KOKA, LANE, RUNGTUSANATHAM

SENIOR LECTURER

KREITNER

LECTURERS

DAVILA, SACK

The faculty in the Department of Management are widely recognized for their work in the areas of strategic management, organizational behavior, human resource management, operations management, and management science. Faculty members emphasize high-tech management, quality, process and project management, decision and risk analysis, globalization, diversity, small business and entrepreneurship, change management, systems dynamics, organizational identity, corporate governance, and human resource management practices in their research, consulting, and teaching.

Department of Management faculty take great pride in their teaching excellence and have been very active in continuing to improve collaborative teaching techniques. Eight management faculty and teaching assistants have won recent college- or university-level awards for their excellence in teaching effectiveness.

MANAGEMENT—B.S.

Understanding of theory and concepts of management are enhanced by experiencing and testing these concepts in skill-based exercises and cases throughout the curriculum. After analyzing surveys of graduates, their employers, and members of the Dean's Council of 100, the department concluded that the major should have a strong emphasis on measurable, competency-based skills. Based on the survey data, the department identified major skill areas that encompass the most important competencies, including

Administrative
 conflict management
 diversity awareness/management
 project management

Analytical

creativity/innovation
 critical analysis skills
 planning/decision-making skills

Coaching/Facilitating

employee motivation
 employee training/development
 mentoring

Communication

persuasion and negotiation
 verbal
 written

Team Orientation

delegation and empowerment
 develop and maintain teamwork
 relationship building

The faculty focus on both understanding theory and developing competency in these specific skills in all management courses, particularly the three courses taken by all management majors: MGT 311 Human Resource Management, MGT 352 Human Behavior in Organizations, and MGT 463 Strategic Management. The emphasis is on special participative exercises and assignments to practice the skills. Some of these skills, such as communicating, team building, and critical analysis are also emphasized in college core classes (MGT 301 Management and Organization Behavior and SCM 300 Global Supply Operations). Further, all undergraduate management classes emphasize skill development exercises for appropriate course topics. Management majors can choose their electives in one of four tracks: general management, managing human resources, small business and entrepreneurship, or managing business processes.

General Management Track

The central purpose of the Management major is to prepare men and women for managerial leadership in a world characterized by demands for continuous improvements in quality; growing technological sophistication; racial, cultural, and gender diversity in the workforce; and expanding globalized markets. This emphasis is on accomplishing the organization's goals in a changing environment by successfully coordinating all available resources. As technological change and global markets create new opportunities for modern organizations, the contemporary manager faces increasingly complex challenges.

To prepare students to meet these challenges, the general management track curriculum is designed to provide exercises and cases that focus on developing competency-based skills. Applications orientations in classroom settings promote the development of administrative, analytic, and communicating skills; coaching and facilitating skills; and a team orientation. This pragmatic focus is developed in both internal and external contexts:

1. legal environment of management activity;
2. the range of human behavior encountered in organizational settings;
3. the interrelation of the component functions of a business;
4. the responsibilities of a firm in contemporary society;

5. the challenges to an organization active in an international arena; and
6. the role of the entrepreneur in the growth of businesses.

The following courses must be taken to complete this track:

MGT 311 Human Resource Management	3
MGT 352 Human Behavior in Organizations.....	3
MGT 434 Social Responsibility of Management	3
MGT 459 International Management	3
MGT 463 Strategic Management <i>L</i>	3
MGT elective	3
<hr/>	
Total	18

This generalist perspective addresses such current issues as diversity in the workplace, global involvement, total quality management, and ethics and other managerial emphases that promote success. An interactive, cooperative learning environment is stressed.

As the preferred track for the individual wanting a general grounding in the management discipline, students find a broad range of opportunities available upon graduation. Service and manufacturing firms, for-profit and not-for-profit organizations, and large and small organizations will immediately benefit from the preparation of these graduates and recruit them for challenging trainee positions or entry-level management positions.

Managing Human Resources Track

People are the common denominator in all organizations. The efficient and effective management of people is central to the success of the organization. Management has been defined as “the process of getting things done through people.” The human resource management track in the Management major introduces students to the spectrum of knowledge necessary to effectively manage people.

This track is designed to train and familiarize future employees, general managers, and human resource specialists with the human resource functional areas, such as performance appraisal, dismissal, and the legal environment surrounding the employment relationship.

Students in this track develop key skills in managing workforce diversity, team building, and negotiation. Focus in this track is on developing skills in managing people. Students are involved in class activities such as cases and experiential exercises that develop skills in preventing and solving human resource problems.

The following courses must be taken to complete this track:

MGT 311 Human Resource Management	3
MGT 352 Human Behavior in Organizations.....	3
MGT 413 Compensation Management.....	3
MGT 423 Employee-Management Relations	3
MGT 463 Strategic Management <i>L</i>	3
MGT elective	3
<hr/>	
Total	18

Large corporations in manufacturing and services, as well as small businesses and consulting firms, hire students who successfully complete this track.

Small Business and Entrepreneurship Track

Managing, growing, developing, and starting small businesses is one of the most vital and challenging segments of the economy. Most new innovations spring from small to midsize firms. New venture opportunities emerge each day. Smaller firms constitute the job-creation engine of the nation. The potential for individual wealth creation largely resides among entrepreneurial firms, and in an era of downsizing, many current and former corporate employees are looking toward self-employment as a long-term career option. The sequence of courses in the small business and entrepreneurship track does not limit student ability to seek employment in the corporate environment. Rather, it provides an enhanced skill set many firms will value, and it offers alternative career options.

The small business and entrepreneurship course sequence provides a broad-based understanding of the entrepreneurial process and the unique problems and challenges faced by smaller firms. In addition, students gain an opportunity to develop their own potential venture concepts.

The following courses must be taken to complete this track:

MGT 311 Human Resource Management	3
MGT 352 Human Behavior in Organizations.....	3
MGT 440 Small Business and Entrepreneurship.....	3
MGT 445 Business Plan Development.....	3
MGT 463 Strategic Management <i>L</i>	3
MGT elective	3
<hr/>	
Total	18

Note that students who have completed MGT 494 ST: Small Business Planning should not take MGT 445 Small Business Plan Development.

Students completing the small business and entrepreneurship track are most likely to work in small businesses or new ventures within larger corporations. Students in this track (or other business majors) may also be interested in the Certificate in Small Business and Entrepreneurship. See “Certificate in Small Business and Entrepreneurship,” page 175.

Managing Business Processes Track

Processes are central to all organizations. Designing and manufacturing a product involves a series of steps in a transformation process starting with raw materials acquisition and continuing through product production, delivery, and use. Determining and delivering a service involves a series of steps in setting service characteristics and providing the service. Specific theories and tools for managing, changing, and continuously improving business processes have been developed and are key ingredients to successfully managing businesses in the global economy.

Students in this track develop key skills in communicating and working with people, particularly in planning and managing process changes. The focus in this track is on understanding key aspects of process design and analysis.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Students are involved in case studies and industry projects dealing with actual process issues. Students in this track focus on developing knowledge and skills in product/service design and management, process improvement and problem solving, analysis of process costs, change management, team approaches to solving process problems, and project management skills.

The following courses must be taken to complete this track:

MGT 311 Human Resource Management	3
MGT 352 Human Behavior in Organizations.....	3
MGT 433 Management Decision Analysis.....	3
or MGT 468 Management Systems (3)	
or MGT 480 Team Management Skills (3)	
MGT 463 Strategic Management <i>L</i>	3
OPM 450 Changing Business Processes <i>L</i>	3
QBA 321 Applied Quality Analysis I <i>L</i>	3
or SCM 432 Materials Management (3)	
—	
Total	18

Because managing and controlling the quality of processes is a key issue in process management, students electing this track are strongly urged to also complete the Certificate in Quality Analysis. See “Certificate in Quality Analysis,” page 154.

Although large corporate manufacturing and service firms will hire students in this new track, there will also be special opportunities for these students to have a strong positive impact in the many start-up and medium-size businesses in Arizona. Many management consulting firms that recruit college graduates are very interested in students from this track.

Approved Electives for Management. The following electives have been approved for the management tracks.

ACC 316 Management Uses of Accounting	3
MGT 413 Compensation Management.....	3
MGT 422 Training and Development.....	3
MGT 423 Employee-Management Relations.....	3
MGT 424 Employee Selection and Appraisal	3
MGT 433 Management Decision Analysis.....	3
MGT 434 Social Responsibility of Management	3
MGT 440 Small Business and Entrepreneurship.....	3
MGT 445 Business Plan Development.....	3
MGT 459 International Management	3
MGT 468 Management Systems	3
MGT 480 Team Management Skills.....	3
MGT 494 Special Topics	3
MKT 302 Fundamentals of Marketing Management	3
OPM 450 Changing Business Processes <i>L</i>	3

Hot Links to Major in Management. More information, hot links to courses and faculty, and any updates on the undergraduate major in Management can be found on the Web at www.cob.asu.edu/mgt.

Major Proficiency Requirements

Students must receive grades of “C” or higher in upper-division courses for the major. If a student receives a grade below “C” in any course in the major, this course must be repeated. If a second grade below “C” is received in either an upper-division course in the major already taken or in a different upper-division course in the major, the student is no longer eligible to take additional upper-division courses in that major.

Graduation Requirements

In addition to fulfilling major requirements, students seeking a degree must meet all university and college requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 152.

GRADUATE PROGRAMS

The Department of Management participates actively in several master’s and Ph.D. programs, particularly the technology M.B.A., executive M.B.A., evening M.B.A., and day M.B.A. programs. For a detailed description of these programs, see the *Graduate Catalog*. Areas of specialization offered by the Department of Management for technology, evening, and executive M.B.A. students include process management in high technology organizations; globalization and diversity management; entrepreneurship and small business development; and management consulting.

The Department of Management has adopted a modular approach to Ph.D. education to improve its ability to deliver focused, high-quality seminars, give students more flexibility in defining their areas of expertise, increase their rate of quality publications, and enhance the quality of Ph.D. placements.

Hot Links to Graduate Programs. More information, hot links to courses and faculty, and any updates on the Department of Management areas of specialization for the M.B.A. programs can be found on the Web at www.cob.asu.edu/mgt.

General information on the M.B.A. programs can be found on the Web at www.cob.asu.edu/mba.

More information, application procedures, hot links to faculty, and any updates on the Ph.D. program in Management can be found on the Web at www.cob.asu.edu/mgt/degree/phdmainpg.htm.

MANAGEMENT (MGT)

MGT 301 Management and Organization Behavior. (3)

fall, spring, summer

Administrative, organizational, and behavioral theories and functions of management, contributing to the effective and efficient accomplishment of organizational objectives. Prerequisites: 1 psychology (social and behavioral) course and 1 sociology course.

MGT 311 Human Resource Management. (3)

fall, spring, summer

Human resource planning, staffing, training and development, compensation, appraisal, and labor relations. Prerequisite: MGT 301.

MGT 352 Human Behavior in Organizations. (3)

fall, spring, summer

Human aspects of business as distinguished from economic and technical aspects and how they influence efficiency, morale, and management practice. Prerequisite: MGT 301.

MGT 380 Management and Strategy for Nonmajors. (3)

fall, spring, summer

Introduction to the functions and applications of management in organizations, including controlling, decision making, leadership, motivation, planning, and social responsibility.

MGT 394 Special Topics. (3)

not regularly offered

MGT 413 Compensation Management. (3)

fall and spring

Establishing base and incentive pay with job analysis, job evaluation, and wage surveys; performance appraisal; conformance to compensation laws. Prerequisites: MGT 311; professional program business student.

MGT 422 Training and Development. (3)*fall and spring*

Learning theory, orientation and basic-level training, management development, resource materials and methods. Prerequisites: MGT 311; professional program business student.

MGT 423 Employee-Management Relations. (3)*fall and spring*

Employment relationship in union/nonunion setting. Employee-management rights/responsibilities, complaint administration, negotiations, union structure, and mock government negotiations.

MGT 424 Employee Selection and Appraisal. (3)*fall and spring*

Concepts and methods of personnel selection and performance appraisal. Includes job analysis, measurement, and legal issues. Emphasizes experiential exercises. Prerequisite: MGT 311.

MGT 433 Management Decision Analysis. (3)*fall and spring*

Decision-making concepts and methods in the private and public sectors and their application to organizational problems. Understanding of individual and group decision making. Prerequisites: MGT 301; professional program business student.

MGT 434 Social Responsibility of Management. (3)*fall, spring, summer*

Relationship of business to the social system and its environment. Criteria for appraising management decisions. Managers as change agents. Prerequisites: MGT 301; professional program business student.

MGT 440 Small Business and Entrepreneurship. (3)*fall, spring, summer*

Opportunities, risks, and problems associated with small business development and operation.

MGT 445 Business Plan Development. (3)*fall and spring*

Develops a complete strategic business plan emphasizing the planning process undertaken by successful small business owners and entrepreneurs. Lecture, discussion, experiential exercise. Prerequisite: MGT 440.

MGT 459 International Management. (3)*fall, spring, summer*

Concepts and practices of multinational and foreign firms. Objectives, strategies, policies, and organizational structures for operating in various environments. Credit is allowed for only MGT 459 or IBS 494 ST: International Management or IBS 494 ST: Multinational Management. Prerequisite: IBS 300 or MGT 301.

MGT 463 Strategic Management. (3)*fall, spring, summer*

Strategic formulation and administration of the total organization, including integrative analysis and strategic planning. To be taken last semester of senior year. Prerequisites: completion of 108 hours, including all other business administration core requirements; professional program business student.

*General Studies: L***MGT 468 Management Systems. (3)***fall and spring*

Systems theory and practice applied to organization process and research. Organizations seen as open systems interacting with changing environments. Prerequisite: MGT 301.

MGT 480 Team Management Skills. (3)*fall and spring*

Cooperative education class teaching team skills in active listening, conflict resolution, decision making, effective meetings, norming, and team roles. Cooperative learning.

MGT 484 Internship. (3)*fall, spring, summer*

Nonmajor elective credit only.

MGT 494 Special Topics. (1–4)*not regularly offered*

Current topics in management, primarily designed for business majors. See the *Schedule of Classes* for current offerings. Possible topics:

- (a) Applied International Management. (3)
- (b) Cultural Factors in International Business. (3)
Prerequisite: IBS 300 or MGT 301 or IBS 494 or MGT 459.

MGT 499 Individualized Instruction. (1–3)*not regularly offered***MGT 502 Organization Theory and Behavior. (3)***once a year*

Important concepts and applications in management, including communication, decision making, group dynamics, leadership, motivation, organization change, and organization design. Prerequisites: computer literacy; graduate degree program student.

MGT 522 Human Resource Activity and the Management of Diversity. (3)*once a year*

Applies general and human resource management principles to work effectively with a diverse spectrum of people. Discussion, exercises. Prerequisite: M.B.A. degree program student.

MGT 522 Human Resource Activity and the Management of Diversity. (3)*once a year*

Applies general and human resource management principles to work effectively with a diverse spectrum of people. Discussion, exercises. Prerequisite: M.B.A. degree program student.

MGT 523 Managing People for Service Advantage. (3)*once a year*

Covers HRM practices that are conducive to building and maintaining internal customer equity and maximizing external customer service. Discussion, lecture, class exercises, cases. Prerequisite: M.B.A. degree program student.

MGT 559 International Management. (2–3)*once a year*

Studies international and cross-cultural influences on management processes and development of global leadership capabilities for experienced management professionals. Discussion, company analyses, case analyses, lecture, guest speakers. Prerequisite: M.B.A. degree program student.

MGT 561 Advanced Integrated Project. (2–3)*once a year*

Capstone project of the high-technology ASU M.B.A. Student teams develop business plans for new technology-based products. Online project. Prerequisite: M.B.A. degree program student.

MGT 570 Management Consulting. (3)*once a year*

Develops understanding of how internal and external consultants add value. Prerequisites: ability to use common business software, including Microsoft Office; familiarity with spreadsheets.

MGT 589 Strategic Management. (3–4)*spring*

Formulation of strategy and policy in the organization, emphasizing the integration of decisions in the functional areas. Prerequisite: M.B.A. degree program student.

MGT 591 Seminar. (1–12)*not regularly offered*

Possible topics:

- (a) Business Plan Competition. (3)
- (b) Entrepreneurship. (3)
- (c) Human Resource Activity and the Management of Diversity. (3)
- (d) Human Resource Management and Service Delivery. (3)
- (e) Human Resources and High-Technology Management. (3)
- (f) International Management. (3)
- (g) Management Consulting. (3)
- (h) Organizational Change and Business Process Consulting. (3)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MGT 593 Applied Projects. (3)*once a year*

Cross-functional teams initiate (possibly implement) organizational change within a local firm. Lecture, discussion, experiential learning. Pre- or corequisite: all core courses in the M.B.A. program.

MGT 598 Special Topics. (3)*not regularly offered*

Graduate special topics chosen from human resources, strategic management, and international management, including special topics in international management in Asia or Europe. Prerequisite: instructor approval.

MGT 791 Seminar: Doctoral Seminar in Management. (1–12)*once a year*

Short module seminars. Possible topics:

- (a) Causal Modeling. (1)
- (b) Change and Coping. (1)
- (c) Cognition: Micro and Macro Perspectives. (1)
- (d) Dysfunction in Workplace. (1)
- (e) Economic Theories of the Firm. (1)
- (f) Levels of Analysis. (1)
- (g) Motivation and Attitudes. (1)
- (h) Organizational Identity and Identification. (1)
- (i) Organizational Learning and Organizational Identity. (1)
- (j) Organizational Performance and Reward Systems. (1)
- (k) Organizational Strategy and Culture. (1)
- (l) Organizational Structure, Technology, and Information Systems. (1)
- (m) Organizational Withdrawal. (1)
- (n) Performance Appraisal. (1)
- (o) Power and Organizational Change. (1)
- (p) Selection. (1)
- (q) Strategy Overview. (1)
- (r) Teams, Groups, and Leadership. (1)
- (s) The Craft of Research. (1)

OPERATIONS MANAGEMENT (OPM)**OPM 394 Special Topics. (3)***not regularly offered*

Current topics in operations and production management, primarily designed for nonbusiness majors. See the *Schedule of Classes* for current offerings, which may, for example, include Operations and Logistics Management for nonmajors.

OPM 450 Changing Business Processes. (3)*once a year*

Describes and analyzes business processes. Generates and evaluates alternatives. Creates improvement and implementation plans. Prerequisites: SCM 300; QBA 221.

*General Studies: L***OPM 540 Quality and Productivity Management. (3)***not regularly offered*

Organizational factors influencing quality and productivity in the production of goods and services. Quality and productivity strategies, improvement programs, and measurement systems. Prerequisite: SCM 502 or instructor approval.

OPM 581 Management of Technology and Innovation. (3)*fall*

Technology life cycles, technology forecasting, new product development process, innovation teams, innovation best practices. Prerequisite: M.B.A. degree program student.

OPM 583 Project Management in Service Organizations. (2–3)*fall*

Project management planning, leadership, and control in service organizations. Discussion, lecture, class exercises, cases. Prerequisite: M.B.A. degree program student.

OPM 585 Facilities Design and Management of Technology. (3)*once a year*

Decisions regarding management of facilities and technology for manufacturing and service firms. Facilities location, layout, process design, and selection.

OPM 586 High-Technology Project Management. (2–3)*fall*

Project management processes for high-technology organizations, including planning, scheduling, team development, and control. Prerequisite: M.B.A. degree program student.

OPM 587 Project Management. (3)*once a year*

Planning, scheduling, and controlling of projects in R & D, manufacturing, construction, and services. Project selection, financial considerations, and resource management. Prerequisite: QBA 502.

OPM 588 Strategic Project Management. (2–3)*fall*

Overview of strategic project management processes, project planning and control, project portfolio management, resource allocation, management of strategic project partners. Discussion, lecture, class exercises, cases. Prerequisite: M.B.A. degree program student.

OPM 591 Seminar. (1–12)*once a year*

Possible topics:

- (a) High-Performance Management Processes. (3)
- (b) Management of Technology. (3)
- (c) Manufacturing Management in High Technology. (3)
- (d) Manufacturing Strategy. (3)
- (e) New Product and Process Development. (3)
- (f) Technology/Project Management. (3)

OPM 593 Applied Projects. (3)*once a year*

Cross-functional teams initiate (possibly implement) organizational change within a local firm. Lecture, discussion, experiential learning. Pre- or corequisite: all core courses in the M.B.A. program.

OPM 791 Doctoral Seminars in Operations and Production Management. (1–12)*not regularly offered*

Short module seminars. Possible topics:

- (a) Management of Technology. (1)
- (b) Manufacturing Strategy. (1)
- (c) Operations Management. (1)
- (d) Project Management. (1)

QUANTITATIVE BUSINESS ANALYSIS (QBA)

For more QBA courses, see "Department of Economics."

QBA 505 Management Science. (3)*not regularly offered*

Quantitative approaches to decision making, including linear programming and simulation, with emphasis on business applications. Prerequisites: MAT 210; QBA 502.

QBA 508 Product and Service Innovation. (3)*fall and spring*

Develops strategies for innovation in products and services. Prerequisites: basic algebra; basic probability concepts; elementary knowledge of Windows.

QBA 550 Intermediate Decision Analysis. (3)*not regularly offered*

Quantitative decision analysis methods for business decision making under uncertainty, including decision diagrams, subjective probabilities, and preference assessment. Prerequisites: MAT 210; QBA 502.

QBA 591 Seminar. (1–12)*fall and spring*

Current topics in quantitative business analysis primarily designed for technology, evening, and executive M.B.A. students. Elective courses for these programs may include the following possible topics:

- (a) Decision Models. (3)
- (b) Decision Models for Consulting. (3)
- (c) Management Problem Solving. (3)
- (d) Strategic Decision Analysis. (3)

QBA 593 Applied Project. (1–12)*not regularly offered***QBA 599 Thesis. (1–12)***not regularly offered***QBA 791 Doctoral Seminars in Quantitative Business Analysis. (1–12)***not regularly offered*

The Department of Management has adopted a modular approach to Ph.D. education. Possible topics:

- (a) Chaos Theory. (1)
- (b) Risk Analysis. (1)
- (c) Strategic Decision Making. (1)
- (d) Systems Dynamics. (1)

Department of Marketing

Michael P. Mokwa
Chair
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 www.cob.asu.edu/mkt

PROFESSORS

BITNER, BROWN, HUTT, JACKSON, KUMAR,
 LASTOVICKA, MOKWA, L. OSTROM, REINGEN,
 SCHLACTER, WARD

ASSOCIATE PROFESSORS

BLASKO, NOWLIS, SINHA, STEPHENS, WALKER

ASSISTANT PROFESSORS

HUNTER, A. OSTROM, ROUNDTREE

SENIOR LECTURER

SPIERS

Study in the field of marketing involves analysis of how organizations plan, organize, deploy, and control their resources to achieve market objectives. Focus is placed on market forces, growth, and the deployment of firms in competitive markets and on the marketing strategy and tactics of the firm. Through the proper selection of courses, a student may prepare for a career in

1. selling and sales management;
2. services and retail marketing;
3. promotion and advertising management;
4. business to business marketing;
5. international marketing;
6. market research and planning;
7. general marketing management; or
8. retail management.

MARKETING—B.S.

The major in Marketing consists of 18 semester hours. The following courses must be included:

MKT 302 Fundamentals of Marketing Management	3
MKT 304 Consumer Behavior	3
MKT 451 Marketing Research	3
MKT 460 Strategic Marketing <i>L</i>	3
Total	12

To complete the major, students, in consultation with their faculty advisors, select six additional hours from among the following list of courses:

MKT 301 Principles of Advertising.....	3
MKT 310 Principles of Selling.....	3
MKT 311 Creative Strategy in Marketing	3
MKT 411 Sales Management	3
MKT 412 Promotion Management.....	3

MKT 424 Retail Management	3
MKT 430 Marketing for Service Industries	3
MKT 434 Industrial Marketing.....	3
MKT 435 International Marketing	3
MKT 484 Internship	3
MKT 499 Individualized Instruction	1-3

Major Proficiency Requirements

Students must receive grades of “C” or higher in upper-division courses for the major. If a student receives a grade below “C” in any course in the major, this course must be repeated. If a second grade below “C” is received in either an upper-division course in the major already taken or in a different upper-division course in the major, the student is no longer eligible to take additional upper-division courses in the major.

GRADUATION REQUIREMENTS

In addition to fulfilling major requirements, students seeking a degree must meet all university and college requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 152.

GRADUATE PROGRAMS

The department offers a distinctive M.B.A. curriculum in services marketing and management. For more information, see the *Graduate Catalog*.

MARKETING (MKT)

MKT 300 Principles of Marketing. (3)

fall, spring, summer

Role and process of marketing within the society, economy, and business organization. Prerequisite: ECN 112.

MKT 301 Principles of Advertising. (3)

fall, spring, summer

Advertising as a communications tool in marketing and business management. Survey of market segmentation, creative strategy, media, and effectiveness measures. Prerequisite: MKT 300.

MKT 302 Fundamentals of Marketing Management. (3)

fall, spring, summer

Marketing planning, implementation, and control by organizations, with special emphasis on identifying market opportunities and developing marketing programs. Prerequisite: MKT 300.

MKT 304 Consumer Behavior. (3)

fall, spring, summer

Applies behavioral concepts in the analysis of consumer behavior and the use of behavioral analysis in marketing strategy formulation. Prerequisite: MKT 300.

MKT 310 Principles of Selling. (3)

once a year

Basic principles underlying the selling process and their practical application in the sale of industrial goods, consumer goods, and intangibles. Prerequisite: MKT 300.

MKT 311 Creative Strategy in Marketing. (3)

once a year

Discussion, application and evaluation of creative concepts and strategies. Creation of a portfolio addressing distinctive advertising/marketing problems and opportunities. Prerequisites: MKT 301; nonbusiness majors must obtain department approval.

MKT 382 Advertising and Marketing Communication. (3)

fall and spring

Introduction for nonbusiness majors to the communication process within marketing and advertising. Creation and presentation of an ad campaign. Not open to business majors. Prerequisites: junior or senior standing; 2.00 ASU GPA.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

MKT 394 Special Topics. (1–4)*fall*

Possible topics:

- (a) Global Markets. (3)
- (b) Marketing and Selling. (3)

MKT 411 Sales Management. (3)*not regularly offered*

Applies management concepts to the administration of the sales operation. Prerequisite: MKT 302.

MKT 412 Promotion Management. (3)*once a year*

Integrates the promotional activities of the firm including advertising, personal selling, public relations, and sales promotion. Prerequisite: MKT 302.

MKT 424 Retail Management. (3)*once a year*

Role of retailing in marketing. Problems and functions of retail managers within various retail institutions. Prerequisite: MKT 300.

MKT 430 Marketing for Service Industries. (3)*once a year*

Concepts and strategies for addressing distinctive marketing problems and opportunities in service industries. Current issues and trends in the service sector. Prerequisites: MKT 300, professional program business student.

MKT 434 Industrial Marketing. (3)*once a year*

Strategies for marketing products and services to industrial, commercial, and governmental markets. Changing industry and market structures. Prerequisite: MKT 302 or instructor approval.

MKT 435 International Marketing. (3)*once a year*

Analyzes marketing strategies developed by international firms to enter foreign markets and to adapt to changing international environments. Prerequisites: MKT 302 (or instructor approval); professional program business student.

MKT 451 Marketing Research. (3)*fall and spring*

Integrated treatment of methods of market research and analysis of market factors affecting decisions in the organization. Prerequisites with a grade of "C" or higher: MKT 302; QBA 221.

MKT 460 Strategic Marketing. (3)*fall and spring*

Policy formulation and decision making by the marketing executive. Integrates marketing programs and considers contemporary marketing issues. Prerequisite: professional program business student. Prerequisites with a grade of "C" or higher: MKT 302, 304, 451.

*General Studies: L***MKT 484 Internship. (3)***fall, spring, summer*

Prerequisite with a grade of "B" or higher: MKT 302.

MKT 494 Special Topics. (1–4)*fall, spring, summer*

Chosen from topics in the marketing and international marketing areas to include seminars in international marketing in Europe and Asia. Possible topics:

- (a) Applied International Marketing

MKT 499 Individualized Instruction. (1–3)*fall, spring, summer*

Topics of special interest chosen by students and agreed to by the departments to do independent studies with a professor acting as a guide.

MKT 502 Marketing Management. (3)*fall, spring, summer*

Managing the marketing function; market and environmental analysis; marketing planning, strategy, and control concepts. Development and management of marketing programs. Prerequisite: ECN 502.

MKT 524 Services Marketing. (3)*once a year*

Strategies for marketing services emphasizing the distinctive challenges and approaches that make marketing of services different from marketing manufactured goods. Prerequisite: MKT 502 (or its equivalent).

MKT 563 Marketing Strategy. (3)*not regularly offered*

Planning and control concepts and methods for developing and evaluating strategic policy from a marketing perspective. Prerequisite: MKT 502.

MKT 584 Internship. (3)*fall, spring, summer***MKT 591 Seminar. (1–12)***once a year*

Offered in conjunction with the M.B.A. program (see M.B.A. program section). Possible topics:

- (a) Business-to-Business Marketing. (3)
- (b) Competitive Strategy for Services. (3)
- (c) Consumer Behavior and Market Strategy. (3)
- (d) Customer Satisfaction/Service Quality Measurement. (3)
- (e) International Marketing. (3)
- (f) Marketing in the Information Age. (3)
- (g) New Product and Service Development. (3)

Small Business Programs

Emma J. Watson

Academic Director

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www.cob.asu.edu/up/smallbusiness.cfm**Mission**

The ASU College of Business, in collaboration with the Center for the Advancement of Small Business, will create and sustain preeminent programs in small business for undergraduate students in all disciplines to prepare them for leadership in small and growing businesses.

Minor in Small Business

The minor in Small Business is available to nonbusiness majors and consists of 18 semester hours, with five required courses and one approved elective. Three *Ca\$hing In*TM seminars are required to graduate. National and local experts present *Ca\$hing In*TM seminars on-campus late in the afternoons three times per semester. COB 380 Small Business Leadership is a prerequisite or corequisite for the other courses. All GPA and semester hour requirements apply as listed.

Requirements

COB 380 Small Business Leadership	3
COB 381 Small Business Accounting and Finance	3
COB 382 Small Business Sales and Market Development	3
COB 383 Small Business Working Relationships	3
COB 384 Small Business Operations and Planning	3
Approved elective	3
Total	18

B.I.S. Concentration in Small Business (B.I.S. Majors Only)

The requirements for the small business concentration are identical to those for the minor in Small Business listed above. For B.I.S. degree requirements, see "Bachelor of Interdisciplinary Studies," page 108.

Certificate in Small Business and Entrepreneurship

A certificate in Small Business and Entrepreneurship is available to only business majors at ASU. The certificate requires 15 semester hours of classes of which the following six semester hours must be included:

MGT 440 Small Business and Entrepreneurship.....	3
MGT 445 Business Plan Development.....	3

The remaining nine semester hours consist of three additional upper-division courses relevant to small business. A copy of the approved electives for business majors pursuing the Certificate in Small Business and Entrepreneurship is available in the Undergraduate Programs Office. To receive the certificate, students must complete the specified business courses with a grade of “C” or higher.

Small Business and Entrepreneurship Track (Management Majors Only). See “Small Business and Entrepreneurship Track,” page 169, for the requirements of this program.

Department of Supply Chain Management

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PROFESSORS

J. CARTER, P. CARTER, ELLRAM, GUNTERMANN,
HENDRICK, JENNINGS, KIRKWOOD, PEARSON, SMELTZER

ASSOCIATE PROFESSORS

ARANDA, BOHLMAN, BROOKS, BUTLER, CHOI, DAVIS,
DUNDAS, KEEFER, LEONARD, LOCK, LYNCH, MALTZ,
MURRANKA, SIFERD, VERDINI

ASSISTANT PROFESSORS

AMUNDSON, CLINTON, KRAUSE

RESEARCH PROFESSOR

MONCZKA

ADJUNCT PROFESSOR

CAVINATO

SENIOR LECTURER

LANGDON

The faculty in the Department of Supply Chain Management offer courses in four separate areas: legal and ethical studies, management communication, real estate, and supply chain management.

Legal and Ethical Studies

The legal and ethical studies faculty offer the undergraduate and the Master of Business Administration core requirements in legal and ethical studies. In addition, the faculty

offer specialized courses in law and ethics relating to health care, insurance, real estate, and professional sports.

Management Communication

The management communication faculty serve the College of Business by teaching the B.S. core requirement BUS 301 Fundamentals of Management Communication.

SUPPLY CHAIN MANAGEMENT—B.S.

Supply chain management is the management of resources to design, procure, fabricate, produce, assemble, store, distribute, deliver, use, maintain, recycle, and dispose of goods and services.

A “supply chain” consists of interconnected companies required to transform ideas into delivered products and services.

Supply chain management is a business approach that focuses on integration and partnerships in order to meet customers’ needs on a timely basis, with relevant and high quality products, produced and delivered in a cost-effective manner.

Current interest in supply chain management stems from the need of world-class organizations to purchase, produce, move, and market goods and services on a global basis. Relentless focus on time, cost, and quality have sharpened the need to coordinate and cooperate with business partners around the world to meet and exceed customers’ needs and wants.

The major in Supply Chain Management consists of the following courses:

SCM 345 Logistics Management.....	3
SCM 355 Supply Management.....	3
SCM 432 Materials Management.....	3
SCM 440 Productivity and Quality Management.....	3
SCM 455 Research and Negotiation L.....	3
SCM 479 Supply Chain Strategy.....	3
Total.....	18

REAL ESTATE—B.S.

The Real Estate faculty offer a unique one-year program designed for the student’s last year of college. This innovative program emphasizes student involvement with real estate executives on projects in the Phoenix metropolitan area. Students are organized in teams to develop their analytical, communication, and team skills.

The program is organized around five aspects of real estate: brokerage/management, development, financing, investments, and market analysis. With the broad interdisciplinary perspective, emphasis on team work, and involvement in projects, students may pursue careers in land development, investment analysis, appraisal, property management, brokerage, and finance.

Successful completion of the program satisfies the requirements of the major based on the following courses:

LES 411 Real Estate Law.....	3
REA 300 Real Estate Analysis.....	3
REA 331 Real Estate Finance.....	3
REA 401 Real Estate Appraisal.....	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

REA 441 Real Estate Land Development.....	3
REA 456 Real Estate Investments	3
Total	18

In addition to the courses listed for the major, students in the program also satisfy the requirement for BUS 301 Fundamentals of Management Communication (listed in the business core) and BUS 451 Business Research Methods (listed as a major support course). Because of the emphasis on teamwork, interaction with business professionals, and completion of all requirements within a year, students may enter the program in only the fall semester.

MAJOR PROFICIENCY REQUIREMENTS

Students must receive grades of “C” or higher in upper-division courses for the major. If a student receives a grade below “C” in any course in the major, this course must be repeated. If a second grade below “C” is received in either an upper-division course in the major already taken or in a different upper-division course in the major, the student is no longer eligible to take additional upper-division courses in that major.

GRADUATION REQUIREMENTS

In addition to fulfilling major requirements, students seeking a degree must meet all university and college requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 152.

BUSINESS (BUS)

BUS 301 Fundamentals of Management Communication. (3)

fall, spring, summer

Written and oral communication in a management context. Prerequisite: CIS 200. Prerequisite with a grade of “C” or higher: ENG 102.

General Studies: L

BUS 451 Business Research Methods. (3)

not regularly offered

Methods of collecting information pertinent to business problem solving, including design, collection, analysis, interpretation, and presentation of primary and secondary data.

General Studies: L

BUS 494 Special Topics. (1–4)

not regularly offered

BUS 502 Managerial Communication. (1–3)

fall and spring

Analysis of various business problems, situations, and development of appropriate communication strategies. Prerequisite: MGT 502.

BUS 504 Professional Report Writing. (3)

once a year

Preparation and presentation of professional reports.

BUS 507 Business Research Methods. (3)

not regularly offered

Techniques for gathering information for business decision making. Selection, design, and completion of a business-oriented research project.

BUS 591 Seminar. (3)

not regularly offered

Selected managerial communication topics.

BUS 594 Study Conference or Workshop. (3)

not regularly offered

BUS 700 Research Methods. (3)

not regularly offered

LEGAL AND ETHICAL STUDIES (LES)

LES 305 Legal, Ethical, and Regulatory Issues in Business. (3)

fall, spring, summer

Legal theories, ethical issues, and regulatory climate affecting business policies and decisions. For students in the College of Business, LES 306 (or its equivalent) is not acceptable in lieu of LES 305.

LES 306 Business Law. (3)

once a year

Legal and ethical aspects of contracts, sales, commercial paper, secured transactions, documents of title, letters of credit, and bank deposits and collections. For students in the College of Business, LES 306 (or its equivalent) is not acceptable in lieu of LES 305.

LES 308 Business and Legal Issues in Professional Sports. (3)

not regularly offered

Economic structure of professional sports and application of contract, antitrust, arbitration, and labor laws in the industry. Prerequisites: 2.00 GPA; junior standing.

LES 380 Consumer Perspective of Business Law. (3)

fall and spring

Role of law as it affects society. Uses case studies to present principles that govern business and consumers. Lecture, television. Prerequisites: 2.00 GPA; junior standing.

LES 411 Real Estate Law. (3)

once a year

Legal and ethical aspects of land ownerships, interests, transfer, finance development, and regulations of the real estate industry.

LES 532 Negotiation Agreements. (3)

fall and spring

Develops negotiation competencies to build partnerships and create lasting agreements with internal/external customers, suppliers, work teams, and external constituencies. Lecture and substantial student interaction through team exercises.

LES 579 Legal and Ethical Issues for Business. (3)

fall and spring

Studies legal and ethical components of business decisions; self-regulation and social responsibility as strategies. Prerequisites: ACC 503; FIN 502; MGT 502.

REAL ESTATE (REA)

REA 300 Real Estate Analysis. (3)

once a year

Applies economic theory and analytical techniques to real estate markets. Topics include law, finance, appraisal, market analysis, investments, development. Prerequisite: professional program business student.

REA 331 Real Estate Finance. (3)

once a year

Legal, market, and institutional factors related to financing proposed and existing properties. Emphasis on current financing techniques and quantitative methods. Prerequisites: FIN 300; professional program business student.

REA 380 Real Estate Fundamentals. (3)

fall and spring

Real estate for the student/consumer with an emphasis on the applied aspects of each area of real estate specialization. Not open to Real Estate majors. Prerequisites: 2.00 ASU GPA; junior standing.

REA 401 Real Estate Appraisal. (3)

once a year

Factors affecting the value of real estate. Theory and practice of appraising and preparation of the appraisal report. Appraisal techniques. Prerequisites: REA 300; professional program business student.

REA 441 Real Estate Land Development. (3)

once a year

Neighborhood and city growth. Municipal planning and zoning. Development of residential, commercial, industrial, and special purpose properties. Prerequisites: REA 300; professional program business student.

REA 456 Real Estate Investments. (3)*once a year*

Analyzes investment decisions for various property types. Cash flow and rate of return analysis. Prerequisites: FIN 300; professional program business student.

REA 461 Current Real Estate Topics. (3)*not regularly offered*

Discusses and analyzes current real estate topics of interest. Prerequisites: REA 300; professional program business student.

SUPPLY CHAIN MANAGEMENT (SCM)**SCM 300 Global Supply Operations. (3)***fall, spring, summer*

Resources and information to create and deliver products globally. Interfirm systems and industry supply chains. Customer, producer, and employee perspectives. Lecture, discussion. Prerequisites: ACC 240; CIS 200; QBA 221.

SCM 301 Supply Chain Management. (3)*not regularly offered*

Examines the purchasing, materials, and logistics management areas. Presents techniques for acquiring, storing, processing, and moving material inventory. Prerequisite: professional program business student.

SCM 345 Logistics Management. (3)*fall and spring*

Managing logistics activities with emphasis on integrating transportation needs with inventory, warehousing facility location, customer service, packaging, and materials handling. Prerequisite: professional program business student majoring in Supply Chain Management. Pre- or corequisite: SCM 300.

SCM 355 Supply Management. (3)*fall and spring*

Management of the supply function, including organization, procedures, supplier selection, quality, inventory decisions, and price determination. Prerequisite: professional program business student majoring in Supply Chain Management. Pre- or corequisite: SCM 300.

SCM 405 Urban Transportation. (3)*not regularly offered*

Economic, social, political, and business aspects of passenger transportation. Public policy and government aid to urban transportation development. Prerequisite: upper-division standing or instructor approval.

SCM 432 Materials Management. (3)*fall and spring*

Studies managing the productive flow of materials in organizations, including MRP II, JIT, quality, facility planning, and job design. Fee. Prerequisites: SCM 300; professional program business student majoring in Supply Chain Management.

SCM 440 Productivity and Quality Management. (3)*fall and spring*

Productivity concepts at the national, organizational, and individual levels. Quality management and its relationship to productivity in all organizations. Prerequisite: professional program business student majoring in Supply Chain Management.

SCM 455 Research and Negotiation. (3)*fall and spring*

Current philosophy, methods, and techniques used to conduct both strategic and operations supply chain management research and negotiation. Includes negotiation simulations. Prerequisite: professional program business student majoring in Supply Chain Management. Prerequisite with a grade of "C" or higher: SCM 355.

*General Studies: L***SCM 460 Carrier Management. (3)***not regularly offered*

Analyzes carrier economics, regulation, management, and rate-making practice; evaluates public policy issues related to carrier transportation. Prerequisite: upper-division standing or instructor approval.

SCM 463 Global Supply Chain Management. (3)*once a year*

Supply chain activities in international business with special emphasis on management of transportation, global sourcing, customs issues, and facility location in a global environment.

SCM 479 Supply Chain Strategy. (3)*fall and spring*

Synthesis of purchasing, production, transportation, and distribution systems to provide an integrated perspective of supply chain management. Prerequisite: professional program business student majoring in Supply Chain Management. Prerequisites with a grade of "C" or higher: SCM 345, 355, 432.

SCM 502 Operations and Supply Management. (3)*fall and spring*

Contemporary management issues, including environmental, project, and supply chain management; new product development; quality control; TQM. Prerequisite: M.B.A. degree program student.

SCM 532 Supply Chain Design and Development Strategies. (3)*fall*

Strategic orientation toward the design and development of the supply chain for purchasing, materials, and logistics systems.

SCM 541 Supply Chain Management and Control. (3)*spring*

Management and control of purchasing and logistics management systems. Total Quality Management to assess and assure customer satisfaction. Global strategies.

SCM 545 Supply Chain Continuous Improvement Strategies. (3)*spring*

Leading-edge strategies such as reengineering high-performance teams and expert systems for continuous improvement of the supply chain. Seminar.

SCM 591 Seminar. (1–12)*not regularly offered*

Possible topics:

- (a) Global Supply Chain Management. (3)
- (b) New Product Development. (3)
- (c) Quality and Productivity Management. (3)
- (d) Services Operations Management. (3)

SCM 791 Doctoral Seminar. (1–12)*once a year*

Possible topics:

- (a) Logistics, Transportation, and Physical Distribution Management. (3)
- (b) Purchasing and Materials Management. (3)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

College of Education

David C. Berliner, Ph.D., Dean

www.ed.asu.edu/coe



Instructor-student interaction adds to the learning experience.

Dave Tevis photo

Division of Curriculum and Instruction	187
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Division of Psychology in Education	196

PURPOSE

For students, choosing a professional college is an important step because it establishes the foundation on which a career will be built. The College of Education provides a stimulating, challenging forum wherein scholars and practitioners interact in the discovery and mastery of the science and art of educational endeavors. This balanced approach, in which research and practice are viewed as essential and complementary, enables the college to produce superior educators.

The purposes of the faculty of the College of Education are as follows:

1. to engage in the scholarly, scientific, and professional study of education;
2. to prepare competent professionals who will serve in a variety of critical educational roles;
3. to develop productive scholars who will make significant contributions to the educational literature and to the quality of educational practice; and
4. to serve the education profession at the local, national, and international levels.

In accord with these purposes, the College of Education is committed to producing quality scholarship and research and to excellence in teaching.

Information about the college can be found on the Web at www.ed.asu.edu/coe.

ORGANIZATION

The College of Education is organized into three divisions. These divisions and their academic program areas are listed below:

Division of Curriculum and Instruction. The Professional Teacher Preparation Program (PTPP) is the largest program in the college, designed to prepare students for teaching positions in elementary education, secondary education, and special education, including bilingual education and English as a second language. Support experiences also come from the Division of Psychology in Education and the Division of Educational Leadership and Policy Studies. The program is a blend of on-campus and school-based methods courses. All programs involve professional school-based internships with experienced teachers. For specific program descriptions, see "Bachelor of Arts in Education," page 182.

The faculty in Curriculum and Instruction are grouped according to their interests into one or more of 10 research clusters. These clusters include curriculum studies; early childhood; equity, diversity, and citizenship; gender; language and literacy; mathematics education; middle level interest; science education; special education and teacher preparation; and professional development. For more information on research clusters and graduate programs, please refer to the *Graduate Catalog*.

College of Education Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Early Childhood Education	B.A.E.	—	Division of Curriculum and Instruction
Elementary Education	B.A.E.	Bilingual education/English as a second language	Division of Curriculum and Instruction
Secondary Education	B.A.E.	Academic specializations: biological sciences, business education, chemistry, Chinese,* economics, English, family and human development (home economics),* French, geography, German, history, Japanese, journalism, mathematics, mathematics/chemistry, mathematics/physics, physical education, physics, physics/chemistry, political science, Russian,* social studies, Spanish	Division of Curriculum and Instruction
Selected Studies in Education*	B.A.E.	—	College of Education
Special Education	B.A.E.	—	Division of Curriculum and Instruction

* Applications are not being accepted at this time.

Division of Educational Leadership and Policy Studies

Educational Administration and Supervision
Educational Policy Studies
Higher and Postsecondary Education
Social and Philosophical Foundations

Division of Psychology in Education

Counseling Psychology
Counselor Education
Educational Psychology
Learning
Lifespan Developmental Psychology
Measurement, Statistics, and Methodological Studies
School Psychology
Educational Technology

Services to students and the community are provided through various centers and offices.

Center for Bilingual Education and Research. The Center for Bilingual Education and Research (CBER) conducts, supports, and encourages research in the field of dual-language education. The purpose of the center's work is to inform public policy. CBER is also engaged in research, program development, and scholarly discourse aimed at improving public education in the border regions of the United States. The center gives special attention to the needs of Spanish-speaking students.

Center for Indian Education. The Center for Indian Education serves as a service agency to Native American communities, school districts, and students attending ASU. The center also conducts research on Indian education in Arizona and other states with American Indian populations.

Office of Student Affairs. The Office of Student Affairs assists individuals interested in teacher preparation programs through advising, admission, retention activities, and certification assistance. Other services include program of study validation, declaration of graduation, petition review, student communication, and high school and community college articulation/relations and recruitment. In addition,

the office provides support services through tutorial assistance and scholarship programs.

Office of Professional Field Experiences. The Office of Professional Field Experiences places all teacher preparation students in public schools and similar institutions for internships and student teaching, monitors students' progress in their field experiences, sponsors courses for mentor teachers, and conducts research on student teacher performance in the field.

Counselor Training Center. The Counselor Training Center provides counseling for ASU students, staff, and the community at large regarding personal, relationship, and career development issues. Counseling is conducted by graduate students in counseling and counseling psychology under the supervision of licensed psychologists.

Other Units. Other units within the college offering specialized research and educational services include the College of Education Preschool and Technology-Based Learning and Research.

TEACHER EDUCATION

Programs that prepare students for teacher certification by the state are available to both the undergraduate pursuing a first degree and the individual with a college degree in a noneducation field.

Undergraduate students interested in teacher certification in art, music, dance, or theatre enroll through programs offered by the Herberger College of Fine Arts. These students must also meet the same eligibility requirements for admission to the Professional Teacher Preparation Program (PTPP) for certification, and a formal application must be submitted to the PTPP.

Undergraduate programs leading to the Bachelor of Arts in Education degree are described in the text and tables that follow. For descriptions of graduate degree programs, see the Graduate Catalog. For more information, see the "College of Education Graduate Degrees and Majors" table, page 180.

College of Education Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Counseling	M.C.	—	Division of Psychology in Education
Counseling Psychology	Ph.D.	—	Division of Psychology in Education
Counselor Education	M.Ed.	—	Division of Psychology in Education
Curriculum and Instruction	M.A.	Bilingual education, communication arts, early childhood education, elementary education, English as a second language, Indian education, mathematics education, reading education, science education, secondary education, social studies education	Division of Curriculum and Instruction
	M.Ed.	Bilingual education, communication arts, early childhood education, elementary education, English as a second language, Indian education, mathematics education, professional studies, reading education, science education, secondary education, social studies education	Division of Curriculum and Instruction
	Ed.D.	Bilingual education, communication arts, curriculum studies, early childhood education, elementary education, English as a second language, Indian education, language and literacy, mathematics education, science education, secondary education, social studies education	Division of Curriculum and Instruction
	Ph.D. ¹	Art education, ² curriculum studies, early childhood education, educational media and computers, ³ elementary education, English education, exercise and wellness education, ⁴ language and literacy, mathematics education, music education, physical education, science education, special education	Interdisciplinary Committee on Curriculum and Instruction
Educational Administration and Supervision	M.Ed., Ed.D.	—	Division of Educational Leadership and Policy Studies
Educational Leadership and Policy Studies	Ph.D.	—	Division of Educational Leadership and Policy Studies
Educational Psychology	M.A., M.Ed.	—	Division of Psychology in Education
	Ph.D.	Learning; lifespan developmental psychology; measurement, statistics, and methodological studies; school psychology	Division of Psychology in Education
Educational Technology	M.Ed., Ph.D.	—	Division of Psychology in Education
Higher and Postsecondary Education	M.Ed., Ed.D.	Higher education	Division of Educational Leadership and Policy Studies
Social and Philosophical Foundations of Education	M.A.	—	Division of Educational Leadership and Policy Studies
Special Education	M.A., M.Ed.	—	Division of Curriculum and Instruction

¹ This program is administered in collaboration with the College of Education and the Graduate College.

² This concentration is administered in collaboration with the Herberger College of Fine Arts.

³ Applications are not being accepted at this time.

⁴ Doctoral courses for this interdisciplinary program administered by ASU Main are offered by ASU East.

ADMISSION

Preprofessional Admission

Students admitted to ASU during their freshman and sophomore years may also be admitted to the College of Education with preprofessional status. Preprofessional students should seek advising within the College of Education through its Office of Student Affairs, EDB L1-13.

Admission to ASU with preprofessional status in the College of Education does not guarantee admission to the PTPP. Admission to the PTPP is a separate process.

Professional Program Admission

Students are eligible for consideration for admission to the PTPP for certification if they meet the following criteria:

1. admission to ASU as a classified student;
2. a minimum cumulative GPA of 2.50;
3. completion of at least 56 semester hours by the time of PTPP admission;
4. submission of scores on the American College Test (ACT) or the Pre-Professional Skills test (PPST) (see “Scores,” on this page);
5. completion of ENG 101 and 102 and General Studies L or SQ and MA requirements with a grade of “C” or higher (courses in progress do not satisfy this requirement); and
6. a special application with additional supporting materials (great emphasis is placed on prior experience, paid or volunteer, working with the age or group of the certification area sought).

Admission is competitive and not guaranteed to all who satisfy the minimum admission criteria.

Some academic units have additional requirements. Students seeking admission to K–8 or secondary education programs (7–12) should consult the Office of Student Affairs in the College of Education (480/965-5555) to determine if there are additional admission requirements for their teaching fields.

PTPP application deadlines are February 1 for fall admission and September 1 for spring admission. Applications can be downloaded via the Web at www.asu.edu/educ/osa.

Because PPST or ACT scores must be included for an application to be complete, applicants should plan to take the test well in advance of application deadlines.

Scores. An ACT composite score of 21 or higher is required, or PPST scores of 172 in math, 173 in reading, and 174 in writing are required. Students who do not meet regular admission standards can still be considered for provisional admission (if scores fall between 18 and 20 on the ACT or 170 and 173 in the PPST). Students who fall under this classification need to fulfill specific academic requirements with the purpose of meeting the regular admission standards in the PTPP in order to demonstrate requisite qualifications for successful teaching and to meet the state’s certification requirements.

Transfer Students

To be considered for admission to the PTPP for certification, transfer students must first be formally admitted to ASU (see “Transfer Applicants,” page 56). Transfer students must attend a Transfer Advising Session (TAS). These sessions are provided in groups according to specialization area and conducted by academic advisors. During the TAS, information is provided regarding the university General Studies requirement, course selection and registration in the College of Education, and admission requirements for the highly competitive Professional Teacher Preparation Program. ASU Undergraduate Admissions should receive the application for admission to ASU, transcripts, applicable test scores, and other required information at least five months before the PTPP application deadline date for the desired PTPP admission semester.

Students should access the ASU Education Transfer Guides for optimal course selection on the Web at www.asu.edu/provost/articulation.



Students walking beside the Administration building

Doug Crouch photo

Declaration of Graduation

A declaration of graduation must be filed during the first semester of enrollment in the PTPP. Preprofessional students completing 87 hours (the university limit for registering without a program of study) who have not been admitted to the PTPP are provided a registration waiver by the College of Education. See “University Graduation Requirements,” page 74.

ADVISING

All students pursuing teaching certificates are strongly encouraged to seek early advising from the Office of Student Affairs in the College of Education, 480/965-5555. Careful planning and early advising in developing an approved program of study are essential if teacher candidates are to complete certification and graduation requirements within the typical 120-semester-hour undergraduate degree program.

Mandatory Advising. Transfer students are required to meet with an academic advisor before registering for their first semester classes. Freshmen must meet with an advisor before registering for each of their first two semesters.

DEGREES

Bachelor of Arts in Education

The faculty in the College of Education offer the Bachelor of Arts in Education (B.A.E.) degree. See the “College of Education Baccalaureate Degrees and Majors” table, page 179, for more information. Candidates for the Bachelor of Arts in Education degree must complete the Professional Teacher Preparation Program (PTPP) offered by the College of Education. Graduates of this program are able to demonstrate proficiency in specified knowledge areas or skills, including the following:

1. principles and application of effective instruction;
2. classroom organization and management;
3. content or subject matter;
4. specific curriculum and teaching strategies;
5. interrelationship of culture and schooling in a multicultural society;
6. human development;
7. communication skills;
8. theories of learning and motivation;
9. assessment and evaluation; and
10. computer literacy.

Each student in the PTPP selects one of ten programs that provide specialized education and preparation. The program areas are

1. Apprentice Teacher Program (ATP)
2. Bilingual Education (K–8)/English as a second language (BLE/ESL)
3. Diné Teacher Education Program
4. Early Childhood Interprofessional Program (birth–third grade)
5. Elementary Education
6. Secondary Education Professional Teacher Preparation (SED) (7–12)

7. Special Education Professional Teacher Preparation (SPE)
8. Teaching for a Diverse Future (TDF)
9. Integrated Certification in Teacher Education (INCITE)
10. Teacher Education for Arizona Mathematics and Science (TEAMS).

Apprentice Teacher Program (ATP). ATP is a fast-track certification option that is completed in one calendar year, January through December, with all course work based in the participating schools. The program conforms to the public school calendar, thus extending the academic year for ASU students by eight weeks. Students are engaged in K–5 classroom experiences and ASU classes from 8 a.m. to 4 p.m., Monday through Friday for 46 weeks. The theoretical premises that undergird the ATP program might be called “practice informed by theory” as students are immersed in both “school” and “teacher” cultures throughout their program. Admission for spring semester only.

Bilingual Education (K–8)/English as a Second Language (BLE/ESL). The Bilingual/ESL program is a four-semester sequence offered in “blocks” with focused field requirements in a professional development school and other bilingual or ESL settings. The bilingual education option prepares teachers to teach elementary students whose primary language is Spanish or a Native American language spoken in Arizona. The ESL option prepares teachers to teach elementary school students from any language background who are still acquiring English as an additional language. Methods courses are divided into BLE or ESL sections, although some course work is planned together to promote collaboration. The program meets Arizona requirements for an elementary education teaching certificate with an endorsement in bilingual education or English as a second language.

Diné Teacher Education Program. The Diné Teacher Education Program is a collaborative effort between Diné College and the ASU College of Education. All course work is done at the Diné College campus (Tsaile, Arizona) and all field placements are in Navajo bilingual classrooms in Navajo schools. The program is designed to prepare Navajo Teachers to teach in Navajo communities of the Navajo Nation. Graduates qualify for an initial teaching certificate for elementary education and an Arizona endorsement in bilingual education. For more information, call 520/724-6819.

Early Childhood Interprofessional Program (Birth–Third Grade). The early childhood program has a core focus on interprofessional education that includes cross-training. Students work with members of other disciplines and collaborate between and across community programs and university departmental structures to promote a broad-based professional preparation. Students participate in schools and community agencies that also operate cross-professionally. The early childhood faculty and its community partners work from a child-sensitive, or constructivist approach that emphasizes constructivist theory, multiple points of view, emergent learning, and a developmental, integrative approach to classroom practice.



Ira D. Payne Education Hall

Marco Fernandez photo

Elementary Education Partnership Program. Students in the Elementary Education Partnership Program work in three different elementary schools, one each semester, prior to their student teaching. Each semester, or block, includes methods courses that are taught on an elementary school campus through an internship of six hours each week. Students become an integral part of the life of the elementary school and assignments link the classroom observations and experiences to the content of the methods courses. Faculty from each of the school sites coordinate assignments and activities to ensure a wide range of learning experiences; some assignments are continued across semesters. Optional course content is in place to qualify all students in this program for a provisional ESL certificate.

Secondary Education Professional Teacher Preparation (SED) (7–12). In order to integrate teacher education preparation with the secondary education requirement for an academic specialization, the College of Education maintains connections with academic departments across the university. Each program semester requires an internship in the schools, and some courses are taught in the field. Graduates are eligible for secondary certification in grades 7–12 in one of 25 subject specializations. Fine arts and physical education majors receive a K–12 endorsement.

Special Education Professional Teacher Preparation (SPE). The SPE leads to certification in K–12 special education for children with learning disabilities, mild mental

retardation, or emotional/behavioral disorders. This program provides preparation in each disability area; however, the certificate the student qualifies for will be determined by their student teaching placement. A school internship is required for each semester. The program is accredited by the Council for Exceptional Children.

Teaching for a Diverse Future (TDF). TDF enrolls one group of students every other year in the fall semester. The program is based on premises derived from work in anthropology, language acquisition, and cognitivist and social interactionist views of the development of mathematical and scientific concepts and curriculum theory. Students work in two elementary schools that honor this perspective throughout the program. Methods courses are distributed across three semesters, and each semester's field experience includes a full-time, two-week immersion. Certification options include a certificate in elementary education, an elementary certificate with an endorsement in bilingual education, or an elementary certificate with an endorsement in ESL. Only available in specific fall semesters.

Integrated Certification in Teacher Education (INCITE). Integrated Certification in Teacher Education is a flexible program that prepares working adults for teaching. This school-based program offers both secondary education and elementary education options, including a middle school endorsement. All course work, including authentic

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

field experience with children, is offered during the evening and on weekends.

Teacher Education for Arizona Mathematics and Science (TEAMS). TEAMS is a year-long, middle grades program leading to secondary certification, middle school endorsement, and a Master's Degree specializing in mathematics, science, and technology. It is based around technology, field based experiences, internships, and course work.

PTPP Certification Areas or Endorsements

- Elementary Education
 - bilingual education
 - English as a second language
- Secondary Education
 - certification in specific academic specializations
 - K–12 endorsements in fine arts and physical education
- Special Education
 - emotionally disabled
 - learning disabilities
 - mental retardation

PTPP students in areas other than Special Education complete a common core of courses as well as courses specific to the area or option selected. Early Childhood Education and Elementary Education prepare students for certification by the state in grades K–8. Students who select these majors develop the knowledge and skills needed to teach children from a variety of language, cultural, and developmental backgrounds. The Early Childhood Education concentration prepares students to work in infant programs, preschools, and grades K–3. The Elementary Education bilingual education/English as a second language (ESL) concentration prepares students to work in bilingual/ESL settings in grades K–8. The Special Education major prepares students to teach mildly handicapped students in diverse settings and for certification in grades K–12 in MR, ED, or LD.

Secondary Education offers programs that prepare students for certification by the state in specific academic subjects in grades 7–12. Students with teaching majors in the Herberger College of Fine Arts earn the appropriate bachelor's degree from that college.

Courses for the academic specialization are determined by the faculty in the academic discipline. Therefore, students with majors in Secondary Education have two academic advisors: one in the college and department of the academic specialization and one in the Office of Student Affairs in the College of Education. For more information, refer to "Academic Specializations," page 185.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements. For more information, see "University Graduation Requirements," page 74.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 hours of approved course work as described in "General Studies," page 78. Note that all three General Studies awareness areas are required. General Studies courses are listed in the "General Studies Courses" table, page 81, in the course

descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

Preprofessional students should complete as many of the General Studies courses as possible before admission to the PTPP. Students are encouraged to consult with an academic advisor to ensure they comply with all necessary requirements.

COLLEGE DEGREE REQUIREMENTS

A minimum of 120 semester hours are required for the B.A.E. degree in these categories:

1. academic specialization (secondary education);
2. college core requirements (Early Childhood Education, Elementary Education, and Special Education majors only); and
3. PTPP.

The College of Education expects its degree candidates to meet individual course assessment standards, field-experience observation criteria, courses required for teacher certification, and other proficiency standards and performance criteria required to demonstrate knowledge and skill in the areas listed under "Bachelor of Arts in Education," page 182.

Program Requirements

Progress toward the B.A.E. degree involves meeting university, college, and division requirements. The degree program also includes courses and academic content required for teacher certification by the State of Arizona. Students seeking certification in one of the fine arts must complete degree requirements in the Herberger College of Fine Arts and specified courses through the PTPP.

MAJOR REQUIREMENTS

Academic Specialization

Courses in the academic specialization give students a greater depth of knowledge in one academic area. A Secondary Education major completes 36 to 60 hours, depending upon the area, in the subject in which the student wishes to be certified; fine arts may require more. Refer to the pages shown in the "Academic Specializations" table, page 185.

College of Education Core Requirements

The programs that prepare students for teacher certification by the state in elementary education, early childhood education, and special education require students to complete semester hours selected from specific core courses pertinent to the teaching area. Teacher candidates should confer with an academic advisor in the Office of Student Affairs regarding course selection.

Professional Teacher Preparation Program (PTPP)

The PTPP is a four-semester sequential program consisting of 36 to 58 semester hours. Ranging from nine to 16 hours per semester, the courses for one semester must be completed before enrolling in the next semester. In other words, courses for one semester usually may not be taken at the same time as those scheduled for another semester. In addition to the PTPP courses, students continue completing the General Studies requirement and core requirements or academic specialization requirements through the third semester of the program.

Selected Studies in Education—B.A.E.

Applications are not being accepted for the major in Selected Studies in Education at this time.

Field Experience Requirements

In addition to course work, students admitted to the PTPP are required to participate in directed field experiences during each of the four semesters of the program. The field experiences progress from short-term observation and participation to long-term supervised practice teaching.

Students should expect these field experiences to be above and beyond the class times listed in the *Schedule of Classes* for each semester. Such field experiences typically take place in public schools throughout the greater Phoenix area. Regular attendance is required during all field experiences. Students should plan extra travel time and expect to confer with placement teachers and field facilitators before or after scheduled field experiences. To meet field experience requirements, students must plan to have their own transportation and *be available during regular school hours*.

Teaching is a highly demanding and extraordinarily complex profession. Students desiring to become teachers must maintain academic standards and demonstrate requisite qualifications for successful teaching, including effective interpersonal skills, basic communication skills, appropriate professional conduct, and satisfactory performance during field experience assignments.

Observation and participation assignments in the schools during first, second, and third semester field experience placements are designed to prepare students for the highly demanding performance-based student teaching during semester four.

Student Teaching. The culminating field experience, called *student teaching*, occurs in the fourth semester of the PTPP and is a full-day, full-semester obligation. Student teaching is usually possible only during fall and spring semesters.

Admission to Student Teaching (Semester IV). To be admitted to student teaching, a student must have attained a high level of professional standards in previous field experience assignments and meet the following requirements:

1. be in good standing as defined in this policy;
2. completion of any provisional admissions requirement;
3. have no incompletes in PTPP courses;
4. complete all PTPP courses; and
5. have an approved declaration of graduation on file.

There are additional requirements for certain programs. Secondary Education majors may have no more than two required courses remaining in the academic specialization and have no more than two courses to complete in General Studies. Students must also receive approval from their specialization advisor.

Elementary and Special Education majors must have completed all core courses, all methods courses, and may only have two additional courses to complete.

Students must complete the application procedure and approval to student teach from the Office of Professional Field Experiences (EDB L1-14, 480/965-6255) at least 12 weeks before the beginning of the student teaching term. Student teachers must adhere to the calendar, regulations, and philosophy of the schools in which they are placed. Beginning and ending dates for student teaching are determined by the Office of Professional Field Experiences in cooperation with the placement schools. Because student teaching is on a full-day schedule, 8 a.m. to 4 p.m. Monday through Friday for 15 consecutive weeks, student teachers are strongly encouraged to avoid extra activities and course work that would interfere with the heavy demands placed upon them while student teaching.

Academic Specializations

Academic Specialization	Page
Art education ¹	272
Biological sciences	341
Business education	—
Chemistry	347
Chinese ²	388
Dance education ¹	286
Economics ³	—
English	355
Family and human development (home economics) ²	364
French	388
Geography	368
German	388
History	376
Japanese	388
Journalism	479
Mathematics	404
Mathematics/chemistry	404
Mathematics/physics	404
Music ⁴	291
Physical education	361
Physics	421
Physics/chemistry	421
Political science	433
Russian ²	388
Social studies	446
Spanish	388
Theatre education ³	305

¹ Art education and dance education concentrations are under corresponding B.F.A. majors.

² Applications are not being accepted at this time.

³ See an advisor for details.

⁴ Students focus on either the choral-general music or instrumental music concentration under the B.M. degree.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see "ASU Extended Campus," page 683, or access the Web site at www.asu.edu/xed.

ACADEMIC STANDARDS

Preprofessional Status

Students admitted to the College of Education on *preprofessional status* are subject to the general standards of academic good standing of the university. However, students who maintain standards of academic good standing during their freshman and sophomore years do not necessarily qualify for admission to any teacher preparation program offered by the College of Education.

Professional Program Status

Students admitted to the PTPP within the College of Education must maintain academic standards and demonstrate requisite qualifications for successful teaching, including sound physical and mental health, interpersonal skills, basic communication skills, a positive attitude, appropriate professional conduct, and satisfactory performance in field experiences. Because PTPP standards are higher than those for the university, a student who is suspended from the PTPP may still be eligible to enroll in other non-PTPP courses.

A copy of the Retention and Disqualification Policy for the PTPP may be obtained from the Office of Student Affairs, EDB L1-13.

College of Education faculty and placement teachers will routinely review preservice teachers' professional attributes and characteristics to determine if the student is making satisfactory progress at both midterm and final. To maintain good standing, students will need to demonstrate appropriate professional demeanor in field placements and college classes.

Students demonstrating behaviors or characteristics that make it questionable whether they can succeed in the teaching profession are reviewed by the director of the Office of Professional Field Experiences and the director of the Division of Curriculum and Instruction. If necessary, a review panel composed of faculty members who have had direct involvement with the student is convened. Following this review, the student may be referred to the Division of Curriculum and Instruction Standards and Appeals Committee. The committee's review may result in a decision to disqualify the student or the specification of conditions under which continued participation is permitted, i.e., probation.

Students who wish to appeal decisions of the Division of Curriculum and Instruction Standards and Appeals Committee may do so in writing to the dean of the college or the Main Campus Standards Committee. Any exceptions to the retention and disqualification policies and procedures must be approved by the Division of Curriculum and Instruction Standards and Appeals Committee and the dean of the College of Education.

Postbaccalaureate Programs

Postbaccalaureate programs prepare students for certification by the state and are designed for those who hold a bachelor's degree in an area other than education. The college offers postbaccalaureate programs in early childhood education, elementary education, secondary education, and special education. Special education students must qualify for and be concurrently admitted to a master's degree program in special education. Information on postbaccalaureate programs is available through the Office of Student Affairs, EDB L1-13 (480/965-5555). The office provides academic advising and information regarding requirements, procedures, and deadline dates.

A student who wishes to be considered for entry must meet the College of Education admission requirements for postbaccalaureate programs:

1. an earned bachelor's degree from an accredited institution;
2. a cumulative GPA of 2.50 or higher for the last 60 semester hours of credit earned;
3. submission of a completed application form and supporting materials by the appropriate deadline dates during the semester before admission; and
4. completion of an academic specialization for secondary education (consult the Office of Student Affairs, EDB L1-13).

Admission is competitive and not guaranteed to all who satisfy the minimum admission criteria.

Some academic units have additional requirements. Students seeking admission to K-8 or secondary education programs (7-12) should consult the Office of Student Affairs in the College of Education (480/965-5555) to determine if there are additional admission requirements for their teaching fields.

Application deadlines are February 1 for fall admission and September 1 for spring admission. Applicants should contact the Office of Student Affairs for an application.

Student Teaching

Students in a postbaccalaureate program for initial teacher certification must file student teaching applications early in the semester before the student teaching term. Application deadlines are September 15 for spring semester and February 1 for fall semester. To be accepted for student teaching, students must:

1. attain a cumulative ASU GPA of 2.50 or higher in required professional education course work;
2. complete all required professional education course work other than one preapproved course that can be taken concurrently with student teaching (Secondary Education students must also receive approval from their academic specialization advisors);

3. remove all academic deficiencies such as grades of “D,” “E,” or “I” before placement; and
4. obtain a final approval from the Office of Professional Field Experiences (this review considers appropriate professional conduct and satisfactory performance in field settings and academic achievement).

Certification for Teaching

The curricula for both the undergraduate and postbaccalaureate teacher education programs meet the requirements for teacher certification in the State of Arizona.

In addition to the course requirements specified in this catalog, there are other requirements for teacher certification mandated by the State of Arizona including the U.S. Constitution and Arizona Constitution requirement. Some teaching areas have specific math, science, and fine arts requirements. Each student must pass the Arizona Educator Proficiency Assessment, which consists of professional knowledge and subject knowledge tests.

Because these requirements vary over program areas and may be changed at any time, students are encouraged to maintain close contact with the Office of Student Affairs regarding the most current state certification requirements.

The College of Education is approved by the Arizona Department of Education for the preparation of elementary, secondary, and special education teachers. Students who complete an approved program of study and meet all graduation requirements of the university and the college are recommended for certification to the Arizona Department of Education. The Office of Student Affairs maintains information about current certification requirements in Arizona and other states. (This information includes fingerprint clearance and passing the Arizona Educator Proficiency Assessment.)

The College of Education also offers courses for certified teachers leading to special endorsements by the Arizona Department of Education. Of special interest are endorsements in the areas of bilingual education, English as a second language (ESL), middle school education, reading, and school library science. The bilingual education endorsement is required of all teachers specifically responsible for providing bilingual instruction. The ESL endorsement is required of all teachers specifically responsible for providing ESL instruction. Students should contact the Office of Student Affairs for information and advising regarding teaching concentrations or special teaching endorsements.

Independent Learning Course Work for Credit

It is the general policy of the College of Education not to accept course credit for *courses in education* taken through independent learning. Exceptions to this policy may be approved if the independent learning course work has been approved in advance of enrollment in the course by the student’s advisor, respective program coordinator, and division director. In all such cases, an appropriate rationale must be submitted with the request to enroll.

Division of Curriculum and Instruction

Nicholas Appleton
 Director
 (ED 426) 480/965-1644
 www.ed.asu.edu/coe/candi

PROFESSORS

BAKER, BARONE, BITTER, CHRISTIE, EDELSKY, FALTIS, FLORES, GRYSER, GUZZETTI, HUDELSON, McGOWAN, McISAAC, PIBURN, RUTHERFORD, SEARFOSS, STAHL, STALEY, ZUCKER

ASSOCIATE PROFESSORS

ARIAS, BENAVIDES, BLUMENFELD-JONES, COHEN, COHN, Di GANGI, GOMEZ, MCCOY, MIDDLETON, RADER, SMITH, SURBECK, VALLEJO

ASSISTANT PROFESSORS

ANIJAR, FISCHMAN, LAMOREY, MacSWAN, McQUILLAN, ROBERTS, ROLSTAD, TRUJILLO, TSE, YOUNG

CLINICAL ASSOCIATE PROFESSOR

GARCIA

CLINICAL ASSISTANT PROFESSOR

CHRISTINE

LECTURERS

BURSTEIN, COCCHIARELLA, GLASS, KORTMAN, SPANIAS

Professional Teacher Preparation Programs

Apprentice Teacher Program (ATP)
 Bilingual Education (K–8)/English as a Second Language (BLE/ESL)
 Diné Teacher Education Program
 Early Childhood Interprofessional Program (birth–third grade)
 Elementary Education Partnership Program
 Integrated Certification in Teacher Education (INCITE)
 Secondary Education Professional Teacher Preparation (SED) (7–12)
 Special Education Professional Teacher Preparation (SPE)
 Teacher Education for Arizona Mathematics and Science (TEAMS)
 Teaching for a Diverse Future (TDF)

Degrees: B.A.E., M.A., M.Ed., Ed.D., Ph.D.

DEGREES

Bachelor of Arts in Education—B.A.E.

The faculty in the Division of Curriculum and Instruction offer several undergraduate academic programs designed to prepare persons to teach effectively in early childhood,

elementary, secondary, and special education settings. Concentrations available at the undergraduate level include bilingual education, English as a second language (ESL) and Indian education. Programs in special education lead to Arizona teacher certification in the mentally disabled, emotionally disabled, learning disabilities, and early childhood education for the disabled. Programs of study leading to special endorsements by the Arizona Department of Education are bilingual education, ESL, middle school education, reading, and school library science.

GRADUATE PROGRAMS

The faculty in the Division of Curriculum and Instruction offer several graduate degrees in a number of majors.

See “College of Education Graduate Degrees and Majors” table, page 180, and the *Graduate College*.

BILINGUAL EDUCATION (BLE)

BLE 335 Language Diversity in Classrooms. (3)

fall and spring

Issues in sociolinguistics and language variation in schools with a focus on classroom interaction, instruction, curriculum, assessment, and language policy. Lecture, discussion, lab. Corequisites: RDG 414, 481.

BLE 400 Principles of Language Minority Education. (3)

fall and spring

Overview of philosophical and theoretical foundations of bilingual education and ESL models of instruction. Other topics include significant legislative and judicial measures. Lecture, small group discussion. Prerequisite: PTPP admission.

BLE 409 Language-Sensitive Content Teaching. (3)

fall and spring

For preservice students seeking K–8 certification and the endorsement in bilingual education or ESL. Lecture, discussion. Prerequisite: PTPP admission.

BLE 414 Reading Methods, Management, and Assessment in BLE/ESL Settings. (3)

fall and spring

Teaching and assessing reading with emphasis on integrated curriculum and literature-based instruction for BLE/ESL learners. Strategies for decoding (phonics), vocabulary, comprehension, and content area reading. Lecture, lab, discussion. Prerequisite: PTPP admission.

BLE 420 Science Methods, Management, and Assessment in BLE/ESL Settings. (3)

fall and spring

Methods, management strategies, and assessment procedures for teaching science to BLE/ESL students in elementary schools. Lecture, lab, discussion. Prerequisite: PTPP admission.

BLE 433 Language Arts Methods, Management, and Assessment in Elementary BLE/ESL Settings. (3)

fall and spring

Social nature of oral and written, first- and second-language acquisition and congruent teaching, management, assessment practices in BLE/ESL settings. Lecture, lab, discussion. Prerequisite: PTPP admission.

BLE 455 Social Studies Methods, Management, and Assessment in Elementary BLE/ESL Settings. (3)

fall and spring

Examines methods, classroom management strategies, and assessment techniques for social studies instruction in elementary BLE/ESL classes. Lecture, lab, discussion. Prerequisite: PTPP admission.

BLE 478 Student Teaching in the Elementary School. (3–15)

fall and spring

Supervised teaching in the area of specialization. Synthesized experience in curriculum instruction and classroom management in a BLE/ESL setting. Fee. Prerequisite: PTPP admission.

BLE 480 Mathematics Methods, Management, and Assessment in Elementary BLE/ESL Settings. (3)

fall and spring

Teaching, management, and assessment of mathematics in K–8 BLE/ESL settings. Lecture, lab, discussion. Prerequisite: PTPP admission.

BLE 481 Reading Practicum. (3)

fall and spring

Applications of concepts from BLE 414. Supervised school-based experiences in teaching reading to BLE/ESL students. Prerequisite: PTPP admission.

BLE 496 Field Experience. (0)

fall and spring

Application of course content in a bilingual/ESL school setting. Emphasis on observation, pupil management, planning and delivering instruction, and assessment. Fee. Prerequisite: PTPP admission.

BLE 498 Pro-Seminar. (1–7)

fall and spring

Small-group study and research for advanced students within their majors. Prerequisites: PTPP admission; major status in the department (or instructor approval).

BLE 511 Introduction to Language Minority Education. (3)

once a year

Historical, philosophical, theoretical, and pedagogical foundations of language minority education in the United States.

BLE 514 Bilingual/Multicultural Aspects of Special Education. (3)

spring

Theories and issues related to the education of bilingual and culturally diverse exceptional children.

BLE 515 Instructional Methods for Bilingual Students. (3)

fall

Introduction to general dual language teaching approaches and assessment strategies. Focuses on the effective teaching of limited-English-proficient populations. Prerequisite: BLE 511.

BLE 520 ESL for Children. (3)

spring

Examines approaches to second language development and assessment for children congruent with recent research in second language acquisition in children. Prerequisite: BLE 511.

BLE 521 Primary/Elementary Communication Arts in Bilingual Education. (3)

spring

Examination of bilingual/biliterate development of elementary school children, bringing together native and second language, oral language, and literacy development findings with educational practices. Prerequisite: BLE 511.

BLE 522 Literacy/Biliteracy Development. (3)

fall

Acquaints teachers with first- and second-language literacy research, practice, and assessment in elementary school settings (Spanish-English emphasis). Lecture, discussion. Cross-listed as RDG 522. Credit is allowed for only BLE 522 or RDG 522. Prerequisite: BLE 511.

BLE 524 Secondary Sheltered ESL Content Teaching. (3)

fall

Teaching and assessing ESL adolescents in the content areas with an emphasis on integrating language acquisition principles with content learning. Lecture, small group work. Corequisite: BLE 541.

BLE 528 Social Studies for Bilingual/ESL Teachers. (3)

spring

Provides language and instructional methodologies and assessment strategies relevant to bilingual/multicultural students in social studies content delivered in Spanish and English. Prerequisite: BLE 511.

BLE 533 Literacy in Secondary BLE/ESL Settings. (3)

spring

Examines first- and second-language literacy research, practice, and assessment across content areas in secondary school settings. Lecture, discussion. Cross-listed as RDG 533. Credit is allowed for only BLE 533 or RDG 533. Prerequisite: BLE 511.

BLE 535 Sociolinguistic Issues in Bilingual Education. (3)

fall

Survey of major theoretical issues (e.g., language situations, communicative competence, language attitudes) interrelating language, social processes, and bilingual education. Prerequisite: BLE 511.

BLE 541 Nature of Bilingualism/Second Language Acquisition. (3)

once a year

Bilingual and second language acquisition, with emphasis on children and adolescents. Stresses cognitive, social, and cultural aspects. Prerequisite: BLE 511.

BLE 543 Bilingual Education Models. (3)

once a year

Bilingual education programs in other countries; analysis of political, social, economic, and educational implications; practice in planning bilingual education curricula. See also offerings under MCE, SED, SPE, and SPF. Prerequisite: BLE 511.

BLE 561 Parent Involvement in Language Minority Education Programs. (3)

fall and spring

Examines issues, approaches, and strategies for improving parental and community involvement in the schooling of language minority children and youth. Prerequisite: BLE 511.

BLE 565 Literature for Hispanic Youth/Literatura para Jóvenes Hispanoparlantes. (3)

spring

Selects, analyzes, and utilizes literature for Hispanic and Spanish-speaking children and adolescents. Cross-listed as LIS 565. Credit is allowed for only BLE 565 or LIS 565.

BLE 580 Practicum. (1–6)

fall and spring

Provides for practical application in school settings of principles of BLE/ESL. Special permission required.

BUSINESS EDUCATION (BUE)
BUE 480 Teaching Business Subjects. (3)

spring

Organization and presentation of appropriate content for business subjects in the secondary school.

BUE 481 Technology in Business and Vocational Education. (3)

spring in even years

Emerging curricula and instructional technology in business and vocational education. Lecture, hands-on computer instruction.

BUE 501 Principles of Business Education. (3)

fall

History, philosophy, principles, and objectives of business and distributive education.

BUE 502 Organization and Management of Cooperative Programs. (3)

fall

Work-study programs for business occupations in high schools and community colleges.

BUE 503 Competency-Based Business and Vocational Education. (3)

spring

Development and administration of competency-based individualized programs in business and vocational education.

BUE 505 Current Literature in Business and Vocational Education. (3)

spring

Critical analyses, generalizations, and trends in business and vocational education.

BUE 506 Information Processing for Business and Vocational Teachers. (3)

summer

Development of curriculum and strategies for teaching information processing; hardware/software evaluation and equipment acquisition techniques in business and vocational education.

CURRICULUM AND INSTRUCTION (DCI)
DCI 302 Principles and Applications of Effective Instruction. (3)

fall and spring

Principles of teaching identified by research on teaching effectiveness. Application of principles to classroom practice. Prerequisites: EDP 303; education major.

DCI 396 Field Experience I. (0)

fall and spring

First-semester PTPP. Observation and limited participation in a school setting. Focus on observation of development, learning, management, instruction, assessment, and motivation. 4 hours required per week. Fee. Corequisite: semester I of the PTPP.

DCI 397 Field Experience II. (0)

fall

Second-semester PTPP. Observation and limited participation in a school setting. Focus on observation of development, learning, management, instruction, assessment, and motivation. 6 hours required per week. Fee. Corequisite: semester II of the PTPP.

DCI 510 Teacher as Researcher. (3)

fall, spring, summer

Introduces teacher research as a new research genre; offers teachers guidance on planning and conducting research on their practice. Lecture, workshop.

DCI 591 Seminar. (1–12)

not regularly offered

DCI 701 Curriculum Theory and Practice. (3)

fall and spring

Curriculum theory and practice as a field of study. Its current orientations and applications, modes of inquiry, and community of scholars and practitioners. Seminar. Corequisite: master's-level curriculum course.

COLLEGE OF EDUCATION (COE)

See the *Graduate Catalog* for the COE courses.

COUNSELING PSYCHOLOGY (CPY)

See the *Graduate Catalog* for the CPY courses.

EDUCATIONAL ADMINISTRATION AND SUPERVISION (EDA)

See the *Graduate Catalog* for the EDA courses.

HIGHER AND POSTSECONDARY EDUCATION (HED)

See the *Graduate Catalog* for the HED courses.

EARLY CHILDHOOD EDUCATION (ECD)
ECD 300 Principles of Interprofessional Collaboration. (3)

fall and spring

Focuses on the dispositions, experiences, knowledge, and skills necessary for interprofessional collaboration designed for young children and their families. Prerequisite: PTPP admission.

ECD 310 Educational Environments: Infants/Toddlers. (3)

fall, spring, summer

Organizing, planning, and implementing developmentally appropriate educational practices to provide optimal learning environments for infants and toddlers in group settings.

ECD 314 The Developing Child. (3)

fall, spring, summer

Examines all aspects of development of children, birth through age eight, with implications for teachers and parents. Classroom observation and participation required.

ECD 315 Classroom Organization and Guidance in the Early Years. (2)

fall and spring

Develops understanding and application of classroom organization and management principles, strategies, and procedures. Prerequisite: PTPP admission.

ECD 322 Communication Arts in Early Childhood Education. (3)

fall

Factors affecting language development. Setting conditions for learning in listening, speaking, reading, and writing. Prerequisites: ENG 213 (or its equivalent); postbaccalaureate certification program admission.

ECD 378 Practicum in Early Childhood Development. (3)

fall and spring

Provides a field-based experience in selected early childhood settings (outside the public schools before student teaching). Prerequisite: ECD 314.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ECD 400 Inquiry Into Teaching and Learning. (3)*fall and spring*

Foundational basis of the early childhood field, including historical roots, current practices, ethics, models of teaching, and application in early childhood settings. Prerequisite: PTPP admission.

ECD 401 Integrated Curriculum and Assessment: Social Studies and Creative Arts. (3)*fall and spring*

Presents materials, techniques, and resources for a balanced program of social studies and aesthetic expression appropriate for children in preschool through 3rd grade, with emphasis on the integrated curriculum. Prerequisite: PTPP admission.

ECD 402 Integrated Curriculum and Assessment: Math and Science. (3)*fall and spring*

Emphasizes developmentally appropriate educational strategies and instructional techniques in teaching mathematics and science to children in preschool through 3rd grade, within an integrated curriculum approach. Prerequisite: PTPP admission.

ECD 403 Educational Environments: Preschool/Kindergarten/Primary Grades. (3)*fall and spring*

Focuses on interactions between young learners and the physical and social environments encountered in preschool, kindergarten, and primary settings. Prerequisite: PTPP admission.

ECD 404 Teaching Reading and Language Arts in Early Childhood. (3)*fall and spring*

Development of oral and written language from birth to age 8. Describes developmentally appropriate educational strategies for promoting growth in speaking, listening, reading, and writing. Prerequisite: PTPP admission.

ECD 405 Practicum in Teaching Reading and Language Arts in Early Childhood. (2)*fall and spring*

Supervised experience teaching reading and language arts at the preschool, kindergarten, and primary-grade (1–3) levels. Developmentally appropriate strategies to promote young children's speaking, listening, reading, and writing abilities. Prerequisite: PTPP admission.

ECD 414 Interprofessional Practicum. (3)*fall and spring*

Investigates services and agencies available in the local community to parents of children with special needs. Practical experiences with an intermittent seminar format. Dispositions, knowledge, experiences, and skills necessary for interprofessional collaboration across multiple agencies and programs. Prerequisite: PTPP admission.

ECD 496 Field Experience. (0)*fall and spring*

Applies course content in a preschool through 3rd grade setting. Emphasis on observation, focus on child-centered curriculum, planning and delivering instruction, and assessment. Fee. Corequisite: ECD 404.

ECD 501 Interprofessional Collaboration. (3)*fall*

Dispositions, knowledge, experiences, and skills necessary for interprofessional collaboration required of professionals who work with multineed families with young children. Prepares students to implement effective strategies and workable plans to support interprofessional collaboration for providing integrative services to young children and their families.

ECD 521 Primary/Elementary Communication Arts in Bilingual Education. (3)*spring*

Examines bilingual/biliterate development of elementary school children, bringing together native and second language, oral language, and literacy development findings with educational practices. Prerequisite: BLE 511.

ECD 522 Developmental Social Experiences in Early Childhood Education. (3)*fall*

Materials, techniques, aesthetic expression, creative activities, and values in the integrated curriculum.

ECD 525 Emergent Literacy. (3)*spring*

Examines recent research on oral language and literacy development and effective strategies for teaching language and literacy in prekindergarten to grade 3. Lecture, discussion. Cross-listed as RDG 525. Credit is allowed for only ECD 525 or RDG 525.

ECD 527 Mathematics in Early Childhood Education. (3)*fall*

Theory and practice in the use of manipulative materials for teaching mathematics to preschool and primary grade children. Prerequisite: ECD 402 (or its equivalent).

ECD 544 Play Education. (3)*spring and summer*

Theories of play and the educational implications of each. Practical applications at the early childhood level.

ECD 555 Modern Practices in Early Childhood Education. (3)*fall and summer*

Trends and practices, instructional and resource materials, and methods and techniques in early childhood education.

ECD 601 Theories and Issues in Early Childhood Education. (3)*fall and summer*

Current theories and issues in early childhood education. Presents issues of early childhood best practices, policy, theory, research, and evaluation that are of significance to the early childhood professional. Highlights building on the child development conceptual framework as related to theory and practice.

ECD 733 Social and Emotional Development. (3)*once a year*

Inquiry into the social and emotional development dynamics in children, such as peer relationships, self-concept, and parenting processes, with implications for teachers.

ECD 744 Evaluative Procedures: Young Children. (3)*spring*

Critical examination and use of developmentally appropriate evaluative procedures for children from birth through age 8.

ELEMENTARY EDUCATION (EED)**EED 334 Children's Literature and Elementary School Curriculum. (3)***fall and spring*

Selecting and using children's literature in various curriculum areas in elementary school classrooms with diverse student populations. Lecture, discussion, lab. Cross-listed as RDG 334. Credit is allowed for only EED 334 or RDG 334. Prerequisite: professional program admission. Corequisite: DCI 396 or EED 496.

EED 420 Science Methods, Management, and Assessment in the Elementary School. (3)*fall and spring*

Examines philosophies of science and how these relate to the implementation, management, and assessment of science teaching. Lecture, discussion, lab. Fee. Prerequisite: PTPP admission.

EED 433 Language Arts Methods, Management, and Assessment in the Elementary School. (3)*fall and spring*

Theory on the social nature of oral and written language and congruent teaching, management, and assessment practices. Lecture, discussion, lab. Corequisite: EED 455.

EED 444 Organizing the Classroom Culture. (1)*fall and spring*

Examines how teachers can create and maintain a classroom learning community within the context of an elementary school program. Discussion, workshop, lab. Prerequisite: PTPP admission.

EED 455 Social Studies Methods, Management, and Assessment in the Elementary School. (3)*fall and spring*

Teaching methods, classroom management strategies, and assessment techniques for social studies instruction in the elementary grades. Lecture, discussion, lab. Prerequisite: PTPP admission.

EED 478 Student Teaching in the Elementary School. (3–15)*fall and spring*

Supervised teaching in the area of specialization. Synthesized experience in curriculum, instruction, and classroom management. Fee. Prerequisite: PTPP admission.

EED 480 Mathematics Methods, Management, and Assessment in the Elementary School. (3)*fall and spring*

Beginning course in the teaching, management, and assessment of mathematics in grades K–8. Lecture, discussion, lab. Prerequisite: PTPP admission.

EED 496 Field Experience. (0)*fall and spring*

Application of course content in a K–8 school classroom. Emphasis on observation, pupil management, planning and delivery of instruction, and assessment. Fee.

EED 498 Pro-Seminar. (1–7)*not regularly offered*

Possible topics:

- (a) Language and Learning. (3)
General Studies: L

EED 511 Principles of Curriculum Development. (3)*fall, spring, summer*

Contemporary curriculum theories. Curriculum as an interrelated entity. Principles of conceiving and effecting change.

EED 526 Communication Arts in the Elementary School. (3)*spring and summer*

Critical examination of school language arts teaching, focusing on theoretical assumptions regarding oral- and written-language development.

EED 528 Social Studies in the Elementary School. (3)*fall and summer*

Problems and trends of current programs. Development of a balanced and articulated program of social studies.

EED 529 Science in the Elementary School. (3)*spring*

Problems and trends of current programs. Development of a balanced and articulated science program.

EED 530 Outdoor/Environmental Education. (3)*summer*

Use of various outdoor settings as laboratories for classroom-related experience, study, observation, inquiry, research, and recreation. Includes strategies and materials for developing environmental literacy.

EED 537 Mathematics in the Elementary School. (3)*fall and summer*

Contemporary mathematics teaching. Content, materials, and approaches to instruction.

EED 538 Teaching Social Studies with Literature. (3)*fall and summer*

Develops the rationale, resources, and strategies for adopting a literature-based approach to social studies teaching in grades K–8. Lecture, discussion, cooperative learning. Prerequisite: EED 455 (or its equivalent).

EED 578 Student Teaching in the Elementary School. (9–15)*fall and spring*

Supervised teaching for postbaccalaureate students, synthesized experience in curriculum, instruction, and classroom management. Fee. Prerequisites: completion of 21 hours of identified course work from an approved program of study; GPA of 2.50 (postbaccalaureate nondegree) or 3.00 (postbaccalaureate degree); approval of the Office of Professional Field Experiences.

EED 581 Diagnostic Practices in Mathematics. (3)*fall and spring*

Specific skills in diagnosing and treating children's learning difficulties in mathematics. Includes practicum experiences, both on and off campus, in identifying strengths and weaknesses and initial remediation. Prerequisite: instructor approval.

EED 584 Internship. (1–12)*not regularly offered***EED 598 Special Topics. (1–4)***not regularly offered*

Possible topics:

- (a) Using Math Manipulatives/Elementary Schools
Fee.
(b) Using Math Manipulatives/Middle Schools
Fee.

EED 720 Language in Education. (3)*once a year*

Sociolinguistic seminar on language issues in education, including language acquisition, classroom interaction, language attitudes, relation language, and class-gender ethnicity.

INDIAN EDUCATION (IED)**IED 401 Navajo Language and Culture I. (3)***fall*

History and culture are added components to the introduction of language reading, writing, and speaking. Emphasis on basic communication and appreciation of history and culture. Lecture, discussion.

IED 403 Navajo Language and Culture II. (3)*spring*

Emphasis on communication, grammar, and sentence structures. Translations, reading, writing, and discussions of proper and slang language. Includes cultural activities. Lecture, discussion. Prerequisite: IED 401.

IED 410 History of American Indian Education. (3)*fall and spring*

Philosophical and historical review of the development of American Indian education policies in both traditional and contemporary society.
General Studies: SB, C, H

IED 422 Methods of Teaching Indian Students. (3)*spring*

Philosophies, methodologies, and materials used in Indian education. Examines local and tribal classroom materials. Experimentation with new teaching concepts. Prerequisite: IED 410.

IED 430 Issues in Language and Literacy of Indigenous Peoples. (3)*spring*

Examines issues, policies, theoretical foundations, and practices of indigenous peoples and other language minority communities from a sociolinguistics and language reclamation perspective.

*General Studies: HU/SB, C***IED 433 Counseling the Indian Student. (3)***fall*

Techniques and methods used in counseling, with emphasis on understanding Indian cultures and values. Experimentation with new counseling concepts. Prerequisite: IED 410.

IED 444 The Role of Governments in Native Education Policy and Administration. (3)*fall*

Examines the interrelationship of federal Indian policy, federal/state/tribal law, and tribal sovereignty as they have shaped American Indian education. Analyzes administrative practices and personnel, program and fiscal management, and resources as they reflect the historic and present influence of this triad of factors. Credit is allowed for only IED 444 or 544. Lecture, seminar.

*General Studies: SB***IED 460 Yaqui History and Culture. (3)***fall*

Yaqui history and culture ranging from precontact to the present. Larger themes of Yaqui identity, belief systems, family, traditions, community, resistance, dispersion, and survival.

*General Studies: HU/SB, C, H***IED 498 Pro-Seminar. (1–7)***fall and spring*

Possible topics:

- (a) Navajo Language. (3)
Designed for Navajo and non-Navajo speaking students who have little or no knowledge of the Navajo language in its written form. Emphasis on development of reading, writing, and speaking skills.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

IED 500 Administration and Management of Indian Education Programs. (3)*fall*

Emphasis on educational leadership research and practice in the schooling of American Indian students. Examines effective practices.

IED 510 History of American Indian Education. (3)*fall and spring*

Philosophical and historical review of the development of American Indian education policies in both traditional and contemporary society.

IED 530 Issues in Language and Literacy of Indigenous Peoples. (3)*spring*

Examines issues, policies, theoretical foundations, and practices of indigenous peoples and other language minority communities from a sociolinguistics and language reclamation perspective.

IED 544 The Role of Governments in Native Education Policy and Administration. (3)*fall*

Examines the interrelationship of federal Indian policy, federal/state/tribal law, and tribal sovereignty as they have shaped American Indian education. Analyzes administrative practices and personnel, program and fiscal management, and resources as they reflect the historic and present influence of this triad of factors. Credit is allowed for only IED 444 or 544. Lecture, seminar.

IED 560 Yaqui History and Culture. (3)*fall*

Yaqui history and culture ranging from precontact to the present. Larger themes of Yaqui identity, belief systems, family, traditions, community, resistance, dispersion, and survival.

IED 594 Workshop in Indian Education. (6)*summer*

Examines curriculum, pedagogy, community involvement, current issues, and research.

LIBRARY SCIENCE (LIS)**LIS 410 Children's Literature. (3)***fall, spring, summer*

Selects, analyzes, and utilizes modern and classic literature with young readers.

LIS 510 Computers and Technology in the School Library. (3)*fall*

Library uses of technology and computers. Fundamental concepts and issues in library media centers. Prerequisites: both LIS 571 and 581 or only instructor approval.

LIS 533 Current Library Problems. (3)*fall*

Critical analysis of current practices and problems in school librarianship. Prerequisites: a combination of LIS 540 and 561 and 571 and 581 or only instructor approval.

LIS 540 Classification and Cataloging. (3)*fall*

Descriptive cataloging and Dewey Decimal Classification of print and nonprint library materials.

LIS 561 Selection of Library Materials. (3)*fall*

Principles and procedures used in the selection of materials for the school library.

LIS 563 Children's Literature. (3)*fall, spring, summer*

Selects and uses children's literature and related nonprint media to support the elementary school curriculum. Cross-listed as RDG 563. Credit is allowed for only LIS 563 or RDG 563.

LIS 565 Literature for Hispanic Youth/Literatura para Jóvenes Hispanoparlantes. (3)*spring*

Selects, analyzes, and utilizes literature for Hispanic and Spanish-speaking children and adolescents. Cross-listed as BLE 565. Credit is allowed for only BLE 565 or LIS 565.

LIS 571 Basic Reference Resources. (3)*spring*

Provides reference service in the school library. Content and use of basic resources.

LIS 581 School Library Administration. (3)*spring*

Administration of K–12 libraries and media centers.

LIS 584 School Library Internship. (1–6)*fall and spring*

Prerequisites: LIS 410, 540, 561, 571, 581; instructor approval.

MULTICULTURAL EDUCATION (MCE)**MCE 446 Understanding the Culturally Diverse Child. (3)***once a year*

Survey of cultural and linguistic diversity in American education, including education equity, pluralism, learning styles, and roles of schools in a multiethnic society.

*General Studies: C***MCE 447 Diversity in Families and Communities in Multicultural Settings. (3)***fall and spring*

Diversity and the changing role of schools in a multiethnic society. Lecture, simulation activities, discussion.

READING EDUCATION (RDG)**RDG 301 Literacy and Instruction in the Content Areas. (3)***fall, spring, summer*

Required course for all Secondary Education candidates. Introduces theory and instructional strategies for learning written and oral texts across academic disciplines. Prerequisite: PTPP admission.

RDG 334 Children's Literature and Elementary School Curriculum. (3)*fall and spring*

Selecting and using children's literature in various curriculum areas in elementary school classrooms with diverse student populations. Lecture, discussion, lab. Cross-listed as EED 334. Credit is allowed for only EED 334 or RDG 334. Prerequisite: professional program admission. Corequisite: DCI 396 or EED 496.

RDG 414 Teaching Reading/Decoding. (3)*fall and spring*

Emphasizes teaching reading as part of an integrated classroom curriculum. Includes strategies and skills for teaching decoding (phonics), vocabulary, comprehension, study skills, and content area reading. Prerequisite: PTPP admission.

RDG 481 Reading Practicum. (3)*fall, spring, summer*

Applies concepts from RDG 414 in classroom settings. Students demonstrate teaching strategies under supervision. Required for Elementary Education candidates. Prerequisite: PTPP admission.

RDG 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Reading/Decoding. (3)

RDG 505 Developmental Reading. (3)*fall, spring, summer*

For classroom and special reading teachers. Specific professional skills in decoding, comprehension, and evaluation. Required for Special Reading Endorsement. Prerequisite: teaching certificate.

RDG 507 Content Area Literacy. (3)*fall, spring, summer*

Theory, teaching strategies, and practical application concerning learning from text across subject matter disciplines.

RDG 522 Literacy/Biliteracy Development. (3)*fall*

Acquaints teachers with first- and second-language literacy research, practice, and assessment in elementary school settings (Spanish-English emphasis). Lecture, discussion. Cross-listed as BLE 522. Credit is allowed for only BLE 522 or RDG 522. Prerequisite: BLE 511.

RDG 525 Emergent Literacy. (3)*spring*

Examines recent research on oral language and literacy development and effective strategies for teaching language and literacy in prekindergarten to grade 3. Lecture, discussion. Cross-listed as ECD 525. Credit is allowed for only ECD 525 or RDG 525.

RDG 530 Research Issues in Literacy. (3)*spring in odd years*

For graduate students interested in research on major issues related to literacy instruction. Seminar activities include reviewing quantitative and qualitative methods and analyzing literacy research. Prerequisite: COE 501 or DCI 510 or EDP 502.

RDG 533 Literacy in Secondary BLE/ESL Settings. (3)*spring*

Examines first- and second-language literacy research, practice, and assessment across content areas in secondary school settings. Lecture, discussion. Cross-listed as BLE 533. Credit is allowed for only BLE 533 or RDG 533. Prerequisite: BLE 511.

RDG 544 Adolescent Literacy Programs for New Times. (3)*not regularly offered*

Theories, strategies, and issues in developing, implementing, and assessing approaches to literacy instruction for today's diverse adolescent students (grades 7–12). Prerequisite: RDG 507 or instructor approval.

RDG 550 Practicum Experiences in Elementary and Secondary Reading. (3)*spring and summer*

Practicum experience utilizing assessment and instructional techniques for classroom settings. (See RDG 557 for State of Arizona reading endorsement.) Lab. Prerequisite: RDG 505 (or its equivalent).

RDG 556 Assessment and Procedures in Elementary and Secondary Reading. (3)*fall*

Techniques for classroom and clinical reading assessment and instruction. Emphasis on continuous assessment. May be taken concurrently with RDG 557. Recommended for State of Arizona reading endorsement. Lecture, lab. Prerequisite: RDG 505.

RDG 557 Advanced Elementary and Secondary Reading Practicum. (3)*spring and summer*

Advanced practicum experience utilizing specialized reading and other assessment and instruction techniques for classroom and clinic settings. Lab sections. Recommended for State of Arizona reading endorsement. May be taken concurrently with RDG 556. Lab. Prerequisites: RDG 505; instructor approval.

RDG 563 Children's Literature. (3)*fall, spring, summer*

Selects and uses children's literature and related nonprint media to support the elementary school curriculum. Cross-listed as LIS 563. Credit is allowed for only LIS 563 or RDG 563.

RDG 581 Literature-Based Reading Programs. (3)*fall, spring, summer*

For classroom and special reading teachers. The role of literature in the acquisition and development of literacy. Specific suggestions for helping students learn to read and/or expand their reading ability with literature. Introduction to literature studies. Prerequisite: teaching certificate.

RDG 582 Practicum: Literature Studies. (3)*spring*

Practical application of literature study group principles in field sites or through on-campus simulations. Lecture, supervised practice. Prerequisite: RDG 581 or instructor approval.

RDG 596 Gender, Culture, and Literacies. (3)*spring*

Influence of gender and culture on written, oral, and post-typographical texts. Seminar.

RDG 630 Research in Literacy. (3)*not regularly offered*

For advanced graduate students interested in applied research problems, literature of literacy instruction, and major issues related to literacy research. Prerequisite: instructor approval.

SECONDARY EDUCATION (SED)**SED 400 Principles of Effective Instruction in Secondary Education. (3)***fall, spring, summer*

Examines different models of education. Develops and applies appropriate teaching practices for each model to secondary school classrooms. Lecture, discussion. Prerequisite: PTPP admission.

SED 403 Principles, Curricula, and Methods. (3)*fall, spring, summer*

Advanced level of development of knowledge and skills of instructional planning and methods of teaching and evaluating in the secondary school. Requires observation/participation. Prerequisite: PTPP admission.

SED 478 Student Teaching in Secondary Schools. (3–12)*fall and spring*

Practice of teaching. Relationship of theory and practice in teaching. Fee. Prerequisite: PTPP admission.

SED 480 Special Methods of Teaching Social Studies. (3)*fall and spring*

Interdisciplinary approaches; production and collection of materials. Prerequisite: PTPP admission.

SED 496 Field Experience. (0)*fall and spring*

Applies course content in a secondary school setting. Emphasis on observation, pupil management, planning and delivering instruction, and assessment. Fee. Corequisite: SED 403.

SED 501 Introduction to Effective Instruction. (6)*fall, spring, summer*

Introductory course for postbaccalaureate certification program in secondary education. Emphasis on developing basic classroom management, instruction, and evaluation. Includes a field assignment of at least 120 hours. Prerequisite: admission to postbaccalaureate certification program.

SED 522 Secondary School Curriculum Development. (3)*fall, spring, summer*

Social processes, issues, principles, patterns, and procedures in curriculum development.

SED 533 Improving Instruction in Secondary Schools. (3)*fall, spring, summer*

Analyses of procedures, methods, techniques, and experiments in teaching in secondary schools. Prerequisites: SED 478, 578.

SED 577 Issues and Trends in Secondary Education. (3)*not regularly offered*

Analyses of lay and professional reports; problems and issues in American secondary education. Prerequisites: SED 478, 578.

SED 578 Student Teaching in the Secondary Schools. (3–12)*fall and spring*

Practice of teaching. Relationship of theory and practice in teaching. Postbaccalaureate students only. Fee. Prerequisites: completion of approved postbaccalaureate program; minimum 2.50 GPA; approval of the Office of Professional Field Experiences.

SED 588 Human Relations in the Secondary Schools. (3)*once a year*

Problems in human relations inherent in the interaction of pupils, teachers, administrators, nonprofessional staff, and laymen. Prerequisites: SED 478, 578.

SED 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Using Math Manipulatives/Middle Schools
Fee.

SED 711 Secondary Curriculum Development. (3)*spring and summer*

Theories and processes of developing curriculum; evaluation of research. Prerequisites: SED 478, 522 (or its equivalent), 578.

SED 722 Improvement of Instruction in the Secondary School. (3)*fall*

Evaluates the research; issues and theories related to the improvement of instruction. Prerequisite: SED 533.

SPECIAL EDUCATION (SPE)**SPE 294 Special Topics. (1–4)***not regularly offered***SPE 309 Basic Special Education Curriculum. (3)***fall, spring, summer*

Introduction to curricular practices used in inclusion classrooms.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

SPE 311 Orientation to Education of Exceptional Children. (3)*fall, spring, summer*

Includes gifted, mildly handicapped, severely handicapped, and the bilingual/multicultural exceptional child.

General Studies: SB

SPE 312 Mental Retardation. (3)*fall, spring, summer*

Characteristics and assessment specific to mental retardation.

Emphasizes terminology, development, educational programming, and therapeutic procedures. Prerequisite: PTPP admission.

SPE 314 Introduction to Bilingual/Multicultural Special Education. (3)*fall, spring, summer*

Theoretical background and practical application of general issues regarding the education of bilingual/multicultural handicapped children. Prerequisite: PTPP admission.

SPE 336 Behavioral and Emotional Problems in Children. (3)*fall, spring, summer*

Characteristics and assessment specific to emotionally and behaviorally disturbed children. Emphasizes terminology, development, and educational programming. Prerequisite: PTPP admission.

SPE 361 Introduction to Learning Disabilities. (3)*fall, spring, summer*

Characteristics and assessment specific to learning disabilities.

Emphasizes terminology, development, and educational programming. Prerequisite: PTPP admission.

SPE 394 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Basic Special Education Curriculum. (3)
- (b) Inclusion Practices at the Secondary Level. (3)
- (c) Quality Practices in the Collaborative Classroom. (3)

Prerequisite: PTPP admission.

SPE 411 Parent Involvement and Regulatory Issues. (3)*fall and spring*

Emphasis on parent and school relations through effective communication and state and federal regulations impacting services for the handicapped. Prerequisite: PTPP admission.

SPE 412 Evaluating Exceptional Children. (3)*fall and spring*

Normative and criterion-referenced diagnostic techniques, including formative evaluation. Emphasis on application. Requires daily practicum. Prerequisite: PTPP admission.

SPE 413 Methods in Language, Reading, and Arithmetic for Exceptional Children. (3)*fall and spring*

Methods, techniques, and materials for use in prescriptive teaching. Requires daily practicum. Prerequisite: PTPP admission.

SPE 414 Methods and Strategies in Behavior Management. (3)*fall and spring*

Organization and delivery of instruction, including formative evaluation techniques. Techniques of behavior management. Requires daily practicum. Prerequisite: PTPP admission.

SPE 415 Social Behavior Problems of Exceptional Children. (3)*fall and spring*

Analysis and intervention into social behavior problems of exceptional populations. Requires daily practicum. Prerequisite: PTPP admission.

SPE 455 Early Childhood and the Handicapped. (3)*fall*

Early childhood education as it applies to the handicapped child.

SPE 478 Student Teaching in Special Education. (3–15)*fall and spring*

"Y" grade only. Fee. Prerequisite: PTPP admission.

SPE 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Instruction in Content Areas: Science/Social Studies. (3)

Prerequisite: PTPP admission.

SPE 496 Field Experience. (0)*not regularly offered*

Applies course content in a special education setting. Emphasis on observation, pupil management, planning and delivering instruction, and assessment. Fee. Prerequisite: PTPP admission.

SPE 498 Pro-Seminar. (1–7)*fall and spring*

Possible topics:

- (a) Field Experience. (1–3)

Applies course content in a special education setting. Emphasis on observation, pupil management, planning and delivering instruction, and assessment. Fee. Prerequisite: PTPP admission.

SPE 510 Inclusionary Curriculum for Special Education Teachers. (3)*fall and summer*

Curricular practices used in inclusion classrooms.

SPE 511 The Exceptional Child. (3)*fall, spring, summer*

Educational needs of exceptional children and adults. Not recommended for students who have completed SPE 311.

SPE 512 Individuals with Mental Retardation. (3)*fall, spring, summer*

Etiology, diagnosis, and management of individuals with mental retardation. Current trends in prevention, programming, and teacher preparation. Not recommended for students who have completed SPE 312.

SPE 514 Bilingual/Multicultural Aspects of Special Education. (3)*fall, spring, summer*

Theories and issues related to the education of bilingual and culturally diverse exceptional children.

SPE 515 Methods for the Remediation of Learning Problems of Exceptional Children. (3)*spring*

Methods and materials for remediating the basic academic problems of exceptional children. Prerequisites: SPE 511; methods course in the teaching of reading and mathematics.

SPE 522 Academic Assessment of Exceptional Children. (3)*fall*

Normative and criterion-referenced assessment of learning problems in exceptional children. Includes formative evaluation. Requires practicum. Lecture, practicum. Prerequisites: SPE 311 (or 511); elementary methods courses; program approval.

SPE 523 Prescriptive Teaching with Exceptional Children. (3)*fall*

Language, reading, and arithmetic methods, techniques, and materials used in individualized instruction. Requires practicum. Lecture, practicum. Prerequisites: SPE 311 (or 511); elementary methods courses; program approval. Pre- or corequisite: SPE 522.

SPE 524 Effective Classroom Behavior Management. (3)*spring*

Organization and delivery of instruction including formative evaluation and techniques of academic behavior management for exceptional children. Requires practicum. Lecture, practicum. Prerequisites: SPE 311 (or 511), 522, 523; program approval.

SPE 525 Social Behavior Interventions. (3)*spring*

Analysis and intervention into social behavior problems of exceptional students. Focuses on strategies to change maladaptive social behavior. Requires practicum. Prerequisites: SPE 311 (or 511 or 522 or 523); program approval.

SPE 531 Behavior Management Approaches with Exceptional Children. (3)*fall and summer*

Behavior management approaches for classroom behavior of exceptional children. Prerequisite: SPE 511 (or its equivalent).

SPE 536 Characteristics of Children with Behavioral Disorders. (3)*fall, spring, summer*

Variables contributing to behavior patterns of behaviorally disordered children.

SPE 551 Teaching Young Children with Special Needs. (3)*spring*

Methods, materials, and curriculum for preschool and primary-aged children with special needs. Prerequisites: SPE 455 and 511 (or their equivalents).

SPE 552 Management of Individuals with Severe Handicaps. (3)*spring*

Instruction and management of school-aged and adult individuals with severe, physical, or multiple handicaps. Prerequisites: SPE 511 (or its equivalent); instructor approval.

SPE 553 Developmental/Functional Assessment. (3)

fall

Teacher-focused developmental/functional assessment of preschool and severely, physically, and multiply handicapped individuals. Requires field experience. Prerequisites: SPE 511 and 512 and 574 (or their equivalents).

SPE 554 The Parent/School Partnership. (3)

spring

Includes knowledge and procedures for involvement and training of parents and caregivers of preschool and severely handicapped individuals. Requires field experience. Prerequisites: SPE 455 and 511 (or their equivalents).

SPE 561 Characteristics/Diagnosis of Learning Disabilities. (3)

fall, spring, summer

Theories related to learning disabilities, including identification and characteristics.

SPE 562 Methods of Teaching Students with Learning Disabilities. (3)

not regularly offered

Various methods and intervention strategies for remediating learning disabilities of children and youth. Prerequisite: SPE 361 or 561.

SPE 574 Educational Evaluation of Exceptional Children. (3)

fall

Design and statistical considerations of normative and criterion-referenced tests. Collection, recording, and analysis of data from formative evaluation. Prerequisites: SPE 511 (or its equivalent); methods course in teaching reading and mathematics.

SPE 575 Current Issues in the Education of Exceptional Children. (3)

fall

Mainstreaming, noncategorical, financing, legal diagnostic, labeling, legislative, and other critical and controversial issues related to the education of exceptional children.

SPE 577 Mainstreaming Methods. (3)

spring

Addresses successful mainstreaming methods, practical problem-solving sessions related to teacher's classroom needs, and individual contracts focusing on mainstreaming issues. General educators encouraged.

SPE 578 Student Teaching in Special Education. (9–15)

fall and spring

"Y" grade only. Fee. Prerequisites: completion of specified courses; approval by the special education program coordinator.

SPE 582 Classroom Research with Exceptional Children. (3)

summer

Introduction to interpreting research. Specific research techniques with primary emphasis on classroom research, including applied behavior analysis.

SPE 585 Creativity: Research and Development. (3)

spring

Explores nature of creativity in terms of philosophical underpinnings, empirical evidence, human development, self-actualization, and the ecology surrounding the creative event.

SPE 586 Advising the Gifted Child. (3)

once a year

Focuses on educational planning and guidance, social and emotional development, and family problem solving regarding needs of gifted children.

SPE 587 Controversies in Educating the Gifted. (3)

fall

In-depth analysis of major controversies in educating the gifted, including nature/nurture, the role of mental tests, and sex differences.

SPE 588 The Gifted Child. (3)

fall and summer

Gifted children's characteristics, identification, needs, school and home environments, definitions, and misunderstandings. Research by Pressey, Stanley, Terman, and others.

SPE 589 Methods in Teaching the Gifted. (3)

spring and summer

Methods in teaching elementary and secondary school gifted children, including individualized and computer-assisted instruction, team teaching. Prerequisite: SPE 588.

SPE 774 Characteristics and Causation of Exceptionality. (3)

fall

In-depth analysis of literature pertaining to causes of exceptionality and learning, educational, personal-social, and cognitive characteristics. Lecture, discussion.

SPE 775 Evaluation and Intervention in Special Education. (3)

spring

In-depth analysis of research and literature on evaluation procedures and intervention approaches for exceptional individuals at all age levels. Lecture, discussion.

SPE 781 Research and Evaluation in Special Education. (3)

spring

Issues and problems in conducting research and/or evaluation programs involving exceptional children.

Division of Educational Leadership and Policy Studies

Terrence G. Wiley

Director

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PROGRAM AREAS

Educational Administration and Supervision

Educational Policy Studies

Higher and Postsecondary Education

Social and Philosophical Foundations

Degrees: M.A., M.Ed., Ed.D., Ph.D.

GRADUATE PROGRAMS

The faculty in the Division of Educational Leadership and Policy Studies offer several graduate degrees in a number of majors.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

For more information on courses, faculty, and programs, contact the division office or see the *Graduate Catalog*.

SOCIAL AND PHILOSOPHICAL FOUNDATIONS (SPF)

SPF 111 Exploration of Education. (3)

fall and spring

Education as an instrument in the development of the individual and society, and its significance as an American institution.

General Studies: SB

SPF 301 Culture and Schooling. (3)

fall and spring

For the professional teacher preparation program. Overview of the cultural, social, and political milieus in which formal schooling takes place in the United States. Prerequisite: education major.

General Studies: L

SPF 401 Theory and Practice in Education. (1–2)

fall and spring

For the professional teacher preparation program. Analysis and interpretation of classroom behavior from perspectives derived from philosophy, social science, and law. Prerequisite: education major.

SPF 501 Culture and Schooling. (3)

fall and spring

Introduction to social science concepts of culture and the cultural milieu in which schooling takes place in the United States. Lecture, recitation.

SPF 510 Introduction to Organization and Administration of American Public Schools. (3)

fall and spring

Explores organizational structure and administration of public education through the application of legal and ethical concepts and relevant information of the social sciences. Cross-listed as EDA 510. Credit is allowed for only EDA 510 or SPF 510.

SPF 511 School and Society. (3)

fall, spring, summer

Interrelationship of school and society and the role of education in social change.

SPF 520 Cultural Diversity in Education. (3)

spring

Philosophic and sociological investigation of cultural diversity in the United States and how it relates to education.

SPF 530 Sociology of Education. (3)

fall

Explorations in the history of sociological thought, especially theories of the relations between educational systems and the social/cultural world.

SPF 533 Comparative Education in the Western World. (3)

not regularly offered

Educational practices and traditions in the leading nations of Europe and the Soviet Union.

SPF 544 Philosophical Foundations of Education. (3)

fall

Theories of education in ancient, medieval, and modern classical and contemporary philosophies.

SPF 566 History of Education. (3)

spring

Development of educational institutions and ideas in the Western world, from ancient times to the 20th century.

SPF 603 Visual Ethnography in Education. (3)

spring

Advanced qualitative methods class combining ethnography with the use of video and still photography in data gathering and presentation. Seminar. Corequisite: COE 503.

SPF 612 Evaluation Theory. (3)

fall

Explores the major theories of evaluation (inquiry leading to value judgments) in educational policy through examination of cases.

SPF 622 Organizational Theory. (3)

spring

Major views of organizations and their influence on role definition and participant behaviors in educational organization. Seminar, discussion. Cross-listed as HED 688. Credit is allowed for only HED 688 or SPF 622.

SPF 711 Social and Historical Foundations of Education. (3)

not regularly offered

Problems of American education and their sociohistorical context.

Division of Psychology in Education

Elsie G. J. Moore

Director

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Counseling Psychology
Counselor Education
Educational Psychology
Learning
Lifespan Developmental Psychology
Measurement, Statistics, and Methodological
Studies
School Psychology
Educational Technology

Degrees: M.A., M.C., M.Ed., Ph.D.

GRADUATE PROGRAMS

The faculty in the Division of Psychology in Education offer graduate degrees in a number of majors.

For more information on courses, faculty, and programs, contact the division office or see the *Graduate Catalog*.

COUNSELOR EDUCATION (CED)

CED 294 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Career Development. (1–3)
- (b) Foundations of Leadership. (1–3)
- (c) Leadership Colloquium. (1–3)
- (d) Trio. (1–3)

CED 394 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Special Topics in Leadership. (1)
Courses bring together a faculty member with no more than 12 students to discuss and learn about a specific interest or topic. Topics designed to engage students in intellectual dialogue on one of the themes of leadership, diversity, and service/civic responsibility. Pass/fail elective; taught in the classroom of McClintock Residence Hall. Open to freshmen through senior undergraduates; all majors welcome.

CED 484 Internship. (1–12)

fall and spring

Possible topics:

- (a) Leadership Internship
(b) Leadership Internship and Capstone

CED 493 Honors Thesis. (1–6)

fall and spring

CED 494 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Paraprofessional Training. (3)

CED 498 Pro-Seminar. (1–7)

fall and spring

Possible topics:

- (a) Resident Assistant Experience. (2)

CED 512 Introduction to Helping Relationships. (3)

fall, spring, summer

Introduction to the skills used in the helping professions and an examination of the settings in which they occur.

CED 522 Theories of Counseling and Psychotherapy. (3)

fall, spring, summer

Presentation of major theories of psychological intervention as well as underlying personality theory upon which they are based.

CED 523 Psychological Tests. (3)

fall, spring, summer

Standardized tests in the study of the individual, with emphasis on test score interpretation in counseling.

CED 534 Occupations and Careers. (3)

fall, spring, summer

The world of work, career development, education, and training for occupational entry and mobility.

CED 545 Analysis of the Individual. (3)

fall, spring, summer

Theory and methods commonly used in studying the individual. Observational methods, diagnostic interviews, structured, and semi-structured methods for assessing personality. Pre- or corequisite: CED 523.

CED 567 Group Dynamics and Counseling. (3)

fall, spring, summer

Group process factors, theory, and diversity issues determining effective interaction in small groups. Emphasis placed on lecturettes, self awareness, and experiential components. Lecturettes, discussion, experiential. Prerequisite: admission to graduate degree program.

CED 577 Counseling Prepracticum. (3)

fall, spring, summer

Focus on racial, social, and cultural factors in the development of helping relationships through integration of cognitive and affective self-awareness with counseling skills. Lecture, lab. Prerequisite: admission to M.C. or school counselor certification program. Pre- or corequisite: CED 522.

CED 655 Student Development Programs in Higher Education. (3)

once a year

Emerging conceptual models of student development. Overview of student personnel and student affairs programs in community colleges, four-year colleges, and universities. Observation on campuses.

CED 656 The American College Student. (3)

spring

Overview of American college student from demographic, background characteristics, and values/attitudes/perspectives. Includes access, persistence, and degree completion. Lecture, group discussion, research projects. Cross-listed as HED 679. Credit is allowed for only CED 656 or HED 679.

CED 672 Marriage and Family Counseling. (3)

fall

Introduction to marriage and family counseling theories. Emphasis is on a systems-communication model utilizing cocounseling.

CED 684 Internship in Community Counseling. (3–6)

fall, spring, summer

EDUCATIONAL PSYCHOLOGY (EDP)

EDP 301 Learning and Motivation in Education. (2)

fall and spring

Using a case format, learning and motivation principles are applied to education contexts. Prerequisite: education major.

EDP 302 Assessment and Evaluation in Education. (1)

fall and spring

Using a case format, assessment and evaluation principles are applied to education contexts. Prerequisite: education major.

EDP 303 Human Development. (3)

fall and spring

Selected aspects of child and adolescent development. Emphasis on possibilities for influence by teachers and parents. Prerequisites: CDE 232 (or its equivalent); education major.

General Studies: L

EDP 310 Educational Psychology. (1–6)

fall, spring, summer

Human behavior in educational situations presented through instructional modules. May be repeated for credit for total of 6 hours.

General Studies: SB

EDP 313 Childhood and Adolescence. (3)

fall, spring, summer

Principles underlying total development of pre- and early-adolescent children. Emphasis on physical, intellectual, social, and emotional development with practical implications for teachers grades 5–9. Prerequisite: EDP 303 or admission to College of Education postbaccalaureate program.

EDP 454 Statistical Data Analysis in Education. (3)

fall, spring, summer

Role of data analysis in research and decision making. Elements of exploratory data analysis, descriptive indexes, and statistical inference. Lecture, lab. Prerequisite: MAT 117.

General Studies: CS

EDP 502 Introduction to Quantitative Methods. (3)

fall, spring, summer

Topics in statistical analysis, measurement, and research design. Exploratory data analysis, estimation theory, and statistical inference. Use of computers for data analysis. Cross-listed as COE 502. Credit is allowed for only COE 502 or EDP 502.

EDP 503 Introduction to Qualitative Research. (3)

fall, spring, summer

Terminology, historical development, approaches (including ethnography, ethnomethodology, critical theory, grounded theory, and hermeneutics), and qualitative versus quantitative social sciences; methods of inquiry. Cross-listed as COE 503. Credit is allowed for only COE 503 or EDP 503.

EDP 504 Learning and Instruction. (3)

fall, spring, summer

Introduction to psychology of learning and instruction. Includes the foundations of learning theories and their application to educational practice. Cross-listed as COE 504. Credit is allowed for only COE 504 or EDP 504.

EDP 510 Essentials of Classroom Learning. (3)

fall, spring, summer

Theoretical and empirical foundations of learning in the classroom milieu. Critical exposure to research and method in instructional psychology.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

EDP 513 Child Development. (3)*fall, spring, summer*

Examines problems and achievements experienced by children growing up in a technological society. Emphasis on discovering the child's perspective.

EDP 514 Psychology of the Adolescent. (3)*fall, spring, summer*

Cognitive, physical, and social development of adolescents in contemporary society. Impact of family, school, and workplace on adolescent development. Prerequisite: EDP 310 or PGS 101 (or its equivalent).

EDP 530 Theoretical Issues and Research in Human Development. (3)*fall*

Psychological theories, research, and methods relevant to human development, emphasizing the relations between early development and later performance.

EDP 535 Applied Behavior Analysis. (3)*fall*

Principles of conditioning as applied to behavior. Current research on the experimental analysis of behavior in educational psychology.

EDP 536 Physiology of Behavioral Disorders. (3)*fall*

Critical study of nervous system, brain function for fundamental behaviors, and system dysfunctions in mental/neurological disorders. Prerequisite: instructor approval.

EDP 540 Theoretical Views of Learning. (3)*fall and spring*

Classical and cognitive theories of learning, plus recent orientations. Illustrative experimental and rational foundations; implications for educational practice.

EDP 542 The Psychology of Learning and Instruction. (3)*spring*

Critical review and evaluation of research on learning variables relevant to acquisition and retention of instructional materials. Lab.

EDP 544 Psychology of Reading. (3)*fall*

Alternate analyses of the reading process; designs and procedures for investigating instructional and noninstructional variables related to reading achievement.

EDP 545 Foundational Studies in Language and Learning. (3)*spring*

Historical developments in research relating cognitive models to the instructional process in language learning. Prerequisites: both EDP 540 and 552 or only instructor approval.

EDP 550 Introduction to Measurement in Education. (3)*fall and spring*

Nature and types of educational measures. Critiquing and selecting appropriate measuring devices. Constructing measuring devices. Social controversies about tests. Lecture, lab. Prerequisite: EDP 502 or instructor approval.

EDP 552 Quantitative Data Analysis in Education I. (3)*fall, spring, summer*

Continued treatment of statistical estimation, testing, and research synthesis. Inferential techniques including ANOVA and multiple regression with computers. Lecture, lab. Prerequisite: EDP 502 or instructor approval.

EDP 554 Quantitative Data Analysis in Education II. (3)*fall, spring, summer*

Advanced issues in applied multiple regression and ANOVA. Introduction to ANCOVA. Use of computers for data analysis. Lecture, lab. Prerequisite: EDP 552 or instructor approval.

EDP 556 Data Processing Techniques in Measurement and Research. (3)*once a year*

Use of statistical packages for data analysis. Emphasis on data management, data structures, and related statistical procedures. Lecture, lab. Prerequisite: EDP 552. Pre- or corequisite: EDP 554 or instructor approval.

EDP 560 Individual Intellectual Assessment. (3)*fall and spring*

Issues in administration and interpretation of individual intelligence tests. Theoretical basis, ethical considerations, and diagnostic use of test results. Fee. Prerequisite: admission to a program in professional psychology or instructor approval.

EDP 561 Lab in Psychological Assessment. (3)*spring*

Lab experience in administration, scoring, and interpretation of individual intelligence tests. Lab. Prerequisite: admission to a program in professional psychology or instructor approval. Corequisite: EDP 560.

EDP 562 School Psychology: Theory and Practice. (3)*fall*

Development and present status of school psychology, including an overview of assessment and intervention strategies and professional issues.

EDP 563 Interventions in School Psychology. (3)*fall*

Examines case-based consultation and consultation research relevant to school psychology practice. Field experience. Prerequisite: school psychology program or instructor approval.

EDP 564 Curriculum-Based Assessment and Academic Interventions. (3)*spring*

Constructing, administering, and scoring outcome-based measures. Use of measures for using the various educational decisions.

EDP 566 Diagnosis of Learning Difficulties. (3)*spring*

Clinical diagnosis of learning difficulties, emphasizing specific academic problems. Use and interpretation of diagnostic instruments in practical school situations. Prerequisites: EDP 560 and 562 (or their equivalents); instructor approval.

EDP 567 School Psychological Services to Minority Students. (3)*spring*

Historical perspectives and major issues in psychological and academic assessment and interventions with minority school children.

EDP 568 Diagnosis and Interventions for Children and Adolescents with Emotional Handicaps. (3)*fall*

Clinical diagnosis of emotional handicaps in children and adolescents with emphasis on interpretation of diagnostic instruments and designing appropriate interventions in school settings. Lecture, lab. Prerequisites: EDP 566; PSY 578 (or its equivalent).

EDP 651 Methods and Practices of Qualitative Research. (3)*spring*

Advanced course for students familiar with theory and extant work. Topics include data collection, analysis, reporting, and an extensive fieldwork project. Prerequisite: COE 503.

EDP 652 Multivariate Procedures in Data Analysis I. (3)*fall*

Introduction to matrix algebra. Application of MANOVA, MANCOVA, power analysis, effect size, discriminant and repeated measures analysis with computers. Lecture, lab. Prerequisite: EDP 554 or instructor approval.

EDP 654 Multivariate Procedures in Data Analysis II. (3)*spring*

Treatment of applied multivariate multiple regression, canonical correlation, factor analysis, log-linear models, and structural equation models with computers. Lecture, lab. Prerequisite: EDP 652 or instructor approval.

EDUCATIONAL TECHNOLOGY (EDT)**EDT 300 Computers in Education. (1)***fall, spring, summer*

Introduction to general computer applications, teacher utility programs, World Wide Web, and evaluation of educational software. Required for majors in the College of Education.

EDT 321 Computer Literacy. (3)*fall, spring, summer*

Survey of the role of computers in business and education. Laboratory experience in using word processing, database, and spreadsheet software. 2 hours lecture, 2 hours lab.

*General Studies: CS***EDT 323 Computer Applications. (3)***fall, spring, summer*

Introduction to computer applications such as HyperCard, telecommunications, authoring Languages, and expert systems. Lecture, lab.

General Studies: CS

EDT 405 Presentation Technology for Multimedia. (3)*fall*

Exploration of multimedia hardware and software used in creating presentations for educational, corporate, and commercial applications.

EDT 406 Computer Graphics and Animation. (3)*spring*

Study and application of design and animation techniques for use in video or computer-based presentations.

EDT 455 Authoring Tools. (3)*fall, spring, summer*

Use of current authoring tools to design and deliver computer-based instructional materials.

EDT 501 Foundations and Issues in Educational Technology. (3)*fall and spring*

Introduction to educational technology. Examines accomplishments and issues in the field.

EDT 502 Design and Development of Instruction. (3)*fall and spring*

Design, development, and formative evaluation of objectives-based instructional materials.

EDT 503 Instructional Media Design. (3)*fall and spring*

Uses media selection, design, and production principles to prepare design specifications for solutions to instructional messages and products. Pre- or corequisite: EDT 502.

EDT 504 Development of Computer-Based Instruction. (3)*fall and spring*

Systematic design, development, and formative evaluation of computer-based instruction. Prerequisites: EDT 455 (or instructor approval), 502.

EDT 505 Multimedia Presentation Technologies. (3)*fall*

Explores the design of multimedia presentations and the utilization of tools and resources to effectively deliver those presentations. Lecture, lab.

EDT 506 Educational Evaluation. (3)*spring*

Procedures for evaluating educational programs, training systems, and new-technology applications. Prerequisite: EDT 502.

EDT 511 Technology Applications in Education. (3)*fall and summer*

Integration and evaluation of emerging technologies into K-12 and adult teaching and learning. Online and lecture.

EDT 520 Educational Technology and Training. (3)*spring*

Applications of educational technology to training and human performance systems in business, industry, and government; emphasizing trends and project management. Lecture, lab. Prerequisites: EDT 501, 502.

EDT 523 Distance Education Theory and Practice. (3)*fall*

Explores development of distance learning principles by examining national and international systems and applications. Online and lecture.

EDT 525 Web Resources for Educators. (3)*spring*

Explores Web-based and distance learning applications for educators. Online and lecture.

EDT 527 Instructional Video Production. (3)*spring*

Design and production of instructional video. Lecture, lab. Prerequisite: EDT 503 or instructor approval.

EDT 528 Development of Web-Based Instruction. (3)*fall*

Design and development of online instruction using advanced technologies. Prerequisite: EDT 502.

EDT 531 Hypermedia. (3)*spring*

Design, development, and evaluation of open-ended, nonlinear computer-based tools and applications. Lecture, lab. Prerequisites: EDT 455 (or instructor approval), 502.

EDT 701 Research in Educational Technology. (3)*spring*

Review and analysis of research studies in educational technology. Methodology for designing, conducting, and reporting educational technology research. Prerequisites: EDT 501, 502; instructor approval.

EDT 702 Research in Technology-Based Education. (3)*fall*

Critical exposure to theories, research, and methods in technology-based education.

EDT 703 Research in Distance Education. (3)*spring*

Seminar with emphasis on research in telecommunications and distance education.

EDT 704 Emerging Technologies in Education. (3)*spring*

Examines the role and impact of emerging technologies in education.

EDT 780 Advanced Instructional Development. (3)*spring*

Conducting and documenting selected instructional development activities. Prerequisites: EDT 502; instructor approval.

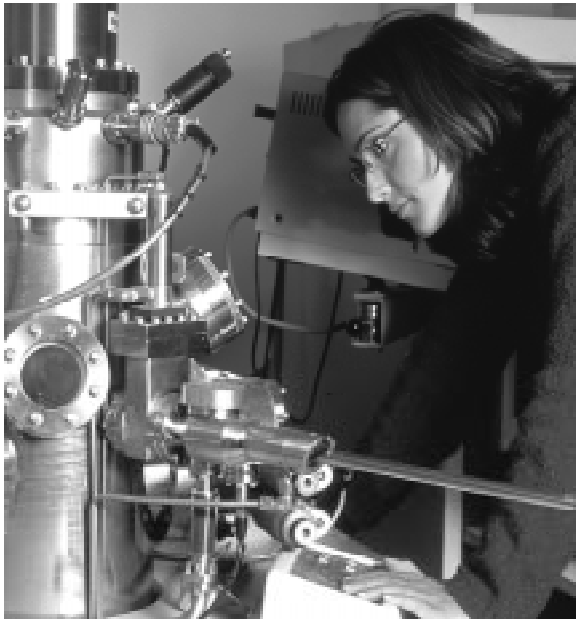
EDT 792 Advanced Educational Technology Research. (3)*fall and spring*

Design and execution of educational technology research on selected topics. Prerequisites: EDT 701; instructor approval.

College of Engineering and Applied Sciences

Peter E. Crouch, Ph.D., Dean

www.eas.asu.edu



Hands-on experience is an important part of the engineering curriculum. John Phillips photo

PURPOSE

The purpose of the College of Engineering and Applied Sciences is to provide students with a range of educational opportunities by which they may achieve competence in the major branches of engineering, in computer science, and construction. Considerable effort is spent on the development and delivery of well-rounded programs that enhance student preparation for professional careers, lifelong learning, and responsible participation as a member of society.

For more information, access the college's Web site at www.eas.asu.edu.

ORGANIZATION

The College of Engineering and Applied Sciences is composed of the following academic and service units (with seven departments making up the School of Engineering):

Del E. Webb School of Construction

School of Engineering

Department of Bioengineering

Department of Chemical and Materials Engineering

Department of Civil and Environmental Engineering

Department of Computer Science and Engineering

Department of Electrical Engineering

Department of Industrial Engineering

Department of Mechanical and Aerospace Engineering

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Department of Bioengineering	215
Department of Chemical and Materials Engineering	220
Department of Civil and Environmental Engineering	229
Department of Computer Science and Engineering	236
Department of Electrical Engineering	243
Department of Industrial Engineering	249
Department of Mechanical and Aerospace Engineering	254
Programs in Engineering Special Studies ...	263

Research Centers. The college is committed to the development of research programs of national prominence and to the concept that research is an important part of its educational role. The college encourages the participation of qualified undergraduate students and graduate students in various research activities. Most of the faculty are involved in government or industry-sponsored research programs in a wide variety of topics. A partial list of these topics includes aerodynamics, biotechnology, computer design, computer-integrated manufacturing, environmental fluid dynamics, innovative engineering education, microelectronics manufacturing, power systems, semiconductor materials and devices, signal processing, solar energy, solid-state electronic devices, structural dynamics, telecommunications, thermosciences, and transportation systems. This research is carried out in the departments and schools listed above and in the following interdisciplinary research centers:

Center for Low Power Electronics

Center for Research on Education in Science, Mathematics, Engineering, and Technology

Center for Solid-State Electronics Research

Center for System Science and Engineering Research

Professional Status Requirements

Student	School	High School Rank	ABOR GPA	Minimum Scores		Transfer GPA*	
				ACT	SAT	Resident	Nonresident
Resident	Construction	Upper 25%	3.00	23	1140	—	—
	Engineering	Upper 25%	3.00	23	1140	—	—
Nonresident	Construction	Upper 25%	3.00	24	1140	—	—
	Engineering	Upper 25%	3.00	24	1140	—	—
Transfer	Construction	—	—	—	—	2.25	2.50
	Engineering	—	—	—	—	2.50	2.50

* The cumulative GPA is calculated using all credits from ASU as well as all transfer credits from other colleges and universities.

Manufacturing Institute
Telecommunications Research Center

Center for Professional Development. The Center for Professional Development, often in cooperation with the college's academic units and research centers, provides a variety of technical conferences, seminars, short courses, and televised and satellite-transmitted programs to enable engineers, scientists, and managers to continue the lifelong learning that is so necessary in a constantly changing world.

Programs may be conducted on campus, at various off-campus locations, or at company sites upon request. For more information, visit the Center for Professional Development in ECG 148, call 480/965-1740, send e-mail to asu.cpd@asu.edu, or access the center's Web site at www.eas.asu.edu/cpd.

ADMISSION

The admission criteria and standards for the B.S. in Computer Science and the B.S.E. in Computer Systems Engineering programs are currently under review and may be changing effective Fall 2001. For current information, contact the Computer Science and Engineering advising office in Goldwater Research Center (GWC) Room 302, or call 480/965-3199.

Individuals wishing to be admitted to freshman standing in the College of Engineering and Applied Sciences should have completed certain secondary-school units. These units are identified in the requirements for each of the two schools in the college. If these conditions are not met, additional university course work, possibly unacceptable for degree credit, may be required.

Entrance requirements of this college may differ from those of other ASU academic units. Students may be admitted under one of two different classifications, professional or preprofessional.

Professional Status. For admission to professional status, Arizona residents and nonresidents must meet one of the requirements as listed in the appropriate section of the "Professional Status Requirements" table, page 201. In addition, students who are required to take the Test of English as a Foreign Language (TOEFL) must earn a score of at least 550 (230 on the computerized version).

Students admitted to the university after successful completion of the General Education Development examination are admitted as preprofessional students within their major.

Professional status is attained by meeting the minimum ACT or SAT score required for admission as listed in the "Professional Status Requirements" table, page 201.

For Computer Science and Computer Systems Engineering professional status requirements, see "Admission Requirements," page 237.

Preprofessional Status. A student not admissible to professional status within the college but otherwise regularly admissible to ASU as stated in "Undergraduate Admission," page 54, may be admitted as a *preprofessional* student to any one of the academic programs of the college. A student admitted into this classification follows the freshman-sophomore sequence of courses as required by the chosen major. Courses are selected with the assistance of an academic advisor. After completing a minimum of 30 semester hours of required or approved elective courses *with a cumulative GPA equivalent to that required of transfer students and corresponding to the chosen major, students may apply for admission to professional status.* Preprofessional students are not permitted to register for 300- and 400-level courses in the college until their status is changed to the professional classification.

Readmission. Students applying for readmission to professional status for any program in this college must have a cumulative GPA for all college course work equal to that of the transfer admission requirements shown in the "Professional Status Requirements" table, page 201.

Transfer into and Within the College. Students transferring between academic programs within the college or from other colleges within the university must meet both the cumulative GPA requirement and the catalog requirements of the desired program in effect at the time of transfer. Students who are transferring from an Arizona community college and have been in continuous residence may continue under the catalog in effect at the time of their entrance into the community college.

Transfer Students. A student who contemplates transferring into this college from another institution, whether a community college or four-year institution, should carefully study the catalog material pertaining to the particular program and consult an advisor in this college before enrolling in the other institution. These steps assure a smooth transition at the time of transfer. Transfer students may request

admission to either preprofessional or professional status in any of the programs offered by this college.

The minimum requirements for admission of resident, nonresident, and transfer students to the professional program are shown in the "Professional Status Requirements" table, page 201. The academic units may impose additional admission and graduation requirements beyond the minimum specified by the college.

Credit is granted for transferred courses deemed equivalent to corresponding courses in the selected program of study, subject to grade and ASU resident credit requirements. No grades lower than "C" are accepted as transfer credit to meet the graduation requirements of this college. Credits transferred from a community college or two-year institution are applied only as lower-division credits. For a listing of the acceptable courses transferable to the various college degree programs, prospective Arizona community college transfer students should consult their advisors and refer to the ASU transfer guides available on the Web at www.asu.edu/provost/articulation.

It should be noted that some courses taken in other ASU colleges or other universities may be acceptable for general university credit but may not be acceptable toward the degree requirements of this college. Determination of those particular courses acceptable to a specific degree program is made within the appropriate academic unit with the approval of the dean.

Non-CEAS Students. Students who are not admissible to programs in this college and who enroll in another college at ASU may not register for any 300- or 400-level courses in this college unless they are required in their degree programs and the students have the proper course prerequisites.

ADVISING

For assistance and counseling in planning a program of study, each student in this college is assigned a faculty advisor who is familiar with the chosen field of specialization and who must be consulted before registering each semester. The student should inform the advisor of any outside work or activity so that course loads may be adjusted accordingly.

Most students attending college find it necessary to obtain part-time employment; consequently, it is suggested that a careful balance of work and class requirements be considered to avoid academic problems.

Students enrolled in an undergraduate degree program in this college may register for a maximum of 19 semester hours each semester. Any student wanting to register for more than the maximum must submit a petition and have an approval on file before registering for the overload.

Students who are enrolled in an undergraduate nondegree status in this college must obtain advising and approval to register before registering each semester from the director of Student Academic Services in ECG 205. For more information, see "Admission of Undergraduate Nondegree Applicants," page 60.

UNDERGRADUATE DEGREES

The faculty in the College of Engineering and Applied Sciences offer programs leading to the B.S. and B.S.E. degrees with majors in the subjects shown in the "College of Engineering and Applied Sciences Baccalaureate Degrees

and Majors" table, page 203. Each major is administered by the academic unit indicated.

Integrated B.S.E.—M.S. Program. To provide greater program flexibility, qualified students of the School of Engineering may undertake a program with an integrated fourth- and fifth-year sequence of study in one of several fields of specialization in engineering. This program provides an opportunity to meet the increasing demands of the profession for graduates who can begin their engineering careers at an advanced level.

Students admitted to this program are assigned a faculty committee that supervises a program of study in which there is a progression in the course work and in which earlier work is given application in the later engineering courses for both the bachelor's and master's degrees. Entry into the integrated program requires an application submitted to the dean through the faculty advisor and the department chair. Applications are reviewed by a school committee that recommends the appropriate action to the dean. The application may be submitted in the fifth semester.

GRADUATE DEGREES

The faculty in the College of Engineering and Applied Sciences offer master's and doctoral degrees as shown in the "College of Engineering and Applied Sciences Graduate Degrees and Majors" table, page 204. School of Engineering faculty participate in offering the Master of Engineering (M.E.) as a collaborative degree program offered by Arizona's three state universities. For more information, see the *Graduate Catalog*.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see "ASU Extended Campus," page 683, or access the Web site at www.asu.edu/xed.

UNDERGRADUATE DEGREE REQUIREMENTS

For detailed information on the degree requirements of a major in the College of Engineering and Applied Sciences, refer to that department's or school's individual description on the following pages.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to department and school requirements, students must meet all university graduation requirements (see "University Graduation Requirements," page 74). A well-planned program of study enables students to meet all

College of Engineering and Applied Sciences Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Del E. Webb School of Construction			
Construction ¹	B.S.	General building construction, heavy construction, residential construction, specialty construction	Del E. Webb School of Construction
School of Engineering			
Aerospace Engineering ¹	B.S.E.	—	Department of Mechanical and Aerospace Engineering
Bioengineering ¹	B.S.E.	—	Department of Bioengineering
Chemical Engineering ¹	B.S.E.	—	Department of Chemical and Materials Engineering
Civil Engineering ¹	B.S.E.	Construction engineering, environmental engineering	Department of Civil and Environmental Engineering
Computer Science ^{1, 2}	B.S.	—	Department of Computer Science and Engineering
Computer Systems Engineering ¹	B.S.E.	—	Department of Computer Science and Engineering
Electrical Engineering ¹	B.S.E.	—	Department of Electrical Engineering
Engineering Interdisciplinary Studies ³	B.S.	—	School of Engineering
Engineering Special Studies ¹	B.S.E.	Premedical engineering	School of Engineering
Industrial Engineering ¹	B.S.E.	—	Department of Industrial Engineering
Materials Science and Engineering ¹	B.S.E.	—	Department of Chemical and Materials Engineering
Mechanical Engineering ¹	B.S.E.	—	Department of Mechanical and Aerospace Engineering

¹ This major requires a minimum of 128 semester hours to complete.

² This major is offered by the College of Liberal Arts and Sciences as well.

³ Applications for this program are not being accepted at this time.

requirements in a timely fashion. Students are encouraged to consult with an academic advisor in planning a program to ensure that they comply with all necessary requirements.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 hours of approved course work in General Studies. General Studies courses are listed in the “General Studies Courses” table, page 81, in the course descriptions in this catalog, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*, or on the Web. Consult with an advisor for an approved list of courses.

First-Year Composition Requirement

As a minimum, completion of ENG 101 and 102, or ENG 107 and 108, or ENG 105 with grades of “C” or higher is required for graduation from ASU in any baccalaureate program. See “First-Year Composition Requirement,” page 74. Any student whose written or spoken English in any course is unsatisfactory may be required by the appropriate director or department chair to take additional course work.

COLLEGE DEGREE REQUIREMENTS

Pass/Fail Grades

Students enrolled in the college do not receive degree credit for pass/fail courses taken at this institution. In addition, no course in this college is offered for pass/fail credit.

Students requesting credit for pass/fail courses taken at another institution must file a Petition for Adjustment to Curriculum Requirements to the department of their major. Each request is judged on its particular merits.

Entry into Upper-Division Courses

Before enrolling in courses at the 300 level and above, students must be in good academic standing in professional program status and have the approval of their advisors. A student who is not in good academic standing must secure approval from his or her advisor and the college’s Student Academic Services. Students whose grades in 300-level courses are unsatisfactory may be required to retake one or more courses for which credit has previously been granted.

The departments and schools have certain additional requirements that must be met in addition to the above college requirements, and students should consult them for details.

Currency of Course Work

Courses taken more than five years before admission to degree programs in this college are not normally accepted for transfer credit at the option of the department in which the applicant wishes to enroll. Courses completed within the five years preceding admission are judged as to their applicability to the student’s curriculum.

College of Engineering and Applied Sciences Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Del E. Webb School of Construction			
Construction	M.S.	Construction science, facilities, management	Del E. Webb School of Construction
School of Engineering			
Aerospace Engineering	M.S., M.S.E., Ph.D.	—	Department of Mechanical and Aerospace Engineering
Bioengineering	M.S., Ph.D.	—	Department of Bioengineering
Chemical Engineering	M.S., M.S.E., Ph.D.	—	Department of Chemical and Materials Engineering
Civil Engineering	M.S., M.S.E., Ph.D.	—	Department of Civil and Environmental Engineering
Computer Science	M.C.S., M.S., Ph.D.	—	Department of Computer Science and Engineering
Electrical Engineering	M.S., M.S.E., Ph.D.	—	Department of Electrical Engineering
Engineering	M.E. ¹	—	School of Engineering
Engineering Science	M.S., M.S.E., Ph.D.	—	School of Engineering
Industrial Engineering	M.S., M.S.E., Ph.D.	—	Department of Industrial Engineering
Materials Engineering	M.S., M.S.E.	—	Department of Chemical and Materials Engineering
Materials Science	M.S. ²	—	Committee on Science and Engineering of Materials
Mechanical Engineering	M.S., M.S.E., Ph.D.	—	Department of Mechanical and Aerospace Engineering
Science and Engineering of Materials	Ph.D. ²	High-resolution nanostructure analysis, solid-state device materials design	Committee on Science and Engineering of Materials

¹ This is a collaborative program offered by the three state universities.

² This program is administered by the Graduate College.

MAJOR REQUIREMENTS

For detailed information on the degree requirements of a major in the College of Engineering and Applied Sciences, refer to that department's or school's individual description on the following pages.

ACADEMIC STANDARDS

Probation. A student is expected to make satisfactory progress toward completion of degree requirements to continue enrollment in the college. Any one of the following conditions is considered unsatisfactory progress and results in the student being placed on probationary status:

1. a semester or summer session with a GPA less than or equal to 1.50;
2. two successive semesters with GPAs less than 2.00; or
3. an ASU cumulative GPA less than 2.00.

Students on probation are subject to disqualification if

1. they do not attain a semester GPA of 2.25;
2. their cumulative GPA is below 2.00 at the end of the probationary semester; or
3. they are placed on probation for two consecutive semesters.

Courses completed during the summer sessions may not be used to reevaluate a student's fall semester probationary status.

Students on academic probation are not allowed to register for more than 13 semester hours of course work. Probationary students may not register for the next semester without a special permit from an advisor in Student Academic Services. Special permits are not given until grades are recorded by the registrar for the current semester.

Disqualification. During a semester on academic probation, a student who fails to meet the retention standards specified above is disqualified. Students may request a review of their disqualification status by contacting the director of Student Academic Services in ECG 205. Any disqualified student who is accepted by another college at ASU may not register for courses in this college unless the courses are required for the new major. Disqualified students who do register for courses in this college may be withdrawn from these courses any time during that semester. Furthermore, students at the university who have been disqualified academically by this college are not eligible to enroll in summer session courses in this college until the disqualification period has expired and they have been reinstated.

Reinstatement. The college does not accept an application for reinstatement until the disqualified student has remained out of this college for at least a 12-month period. Merely having remained in a disqualified status for this period of

time does not, in itself, constitute a basis for reinstatement. Proof of ability to do satisfactory college work in the chosen discipline is required, for example, completing at least 15 semester hours of pertinent courses in the discipline at a community college with higher-than-average grades, and a cumulative GPA of 2.50 or higher for all courses completed.

Student Academic Services. The College of Engineering and Applied Sciences maintains a unit to assist individual students in various matters. This office coordinates the work of the College Academic Standards Committee; administers the probation, disqualification, and readmission processes, student disciplinary actions, and grade grievances; and reviews and processes requests for medical and compassionate withdrawal. This office also administers the college's scholarship program. Additional information is available at www.eas.asu.edu/sas.

STUDENT RESPONSIBILITIES

Course Prerequisites. Students should consult the *Schedule of Classes* and the catalog for course prerequisites. Students who register for courses without the designated prerequisites may be withdrawn without the student's consent at any time before the final examination. Such withdrawal may be initiated by the instructor, the chair of the department offering the course, the director of Student Academic Services, or the dean of the college. In such cases, students will not receive monetary reimbursement. However, such withdrawal is considered to be unrestricted as described under "Grading System," page 67, and does not count against the number of restricted withdrawals allowed.

SPECIAL OPPORTUNITIES

Cooperative Education. The co-op program is a work-study plan of education that alternates periods of academic

study with periods of employment in business, industry, or government. Students who choose this program ideally complete 12 months of employment and graduate with both the academic background and practical experience gained from working with professionals in a chosen field.

A student in the college is eligible to apply to the co-op program upon completion of 45 or more hours of classes required for the selected major. Transfer students are required to complete at least one semester at ASU before beginning work. All student applicants must have a GPA of at least 2.50 and the approval of an advisor and the dean of the college.

To maintain continuous student status in the university, each co-op student must be enrolled in ASE 399 Cooperative Work Experience for one semester hour during each work session. Such credit cannot be applied toward degree requirements. For more information, visit Student Academic Services in ECG 205, or call 480/965-1750, and visit the Career Services office in SSV 329, or call 480/965-2350.

Foundation Coalition. ASU is a member of the Foundation Coalition, a National Science Foundation-funded group of seven institutions of higher learning across the U.S. that is working to improve engineering education. Foundation Coalition programs are intended to

1. demonstrate and promote the interrelationships of subject matter within the curriculum;
2. improve the interpersonal skills of students and the understanding of concepts through the use of more teaming and cooperative learning environments;
3. increase the use of technology in the curriculum; and
4. assess and evaluate intended improvements.



ASU was named a Research Extensive university by the Carnegie Foundation for the Advancement of Teaching.

Kenneth Sweat photo

Such changes address the desires of employers, increase the numbers of baccalaureate degrees earned by members of currently underrepresented groups, and promote curriculum improvement. Foundation Coalition programs are available to all freshmen and sophomores in the School of Engineering and to juniors and seniors in Electrical Engineering and Industrial Engineering.

Foundation Coalition programs offer students a more hands-on, team-based, computer-intensive approach to the curriculum. The freshman programs provide an important opportunity for new students to get to know a small group of students, making a large university seem less overwhelming. The programs also involve more interactions with faculty and access to special tutors. Most students get a team-based, computer-intensive education in ECE 100 (or ECE 194) Introduction to Engineering Design, but the Foundation Coalition program extends this experience to many more subjects and courses.

Freshmen Foundation Coalition programs offer both an integrated set of courses that include engineering, calculus, physics, and English in both the first and second semesters, and smaller packages that include engineering, math, science, and English. In these packages, the same set of students take all of the courses in the package in high-tech, team-promoting classrooms while the faculty work together to deliver a unified set of courses. Sophomore programs involve courses in mathematics, mechanics, and electrical circuits.

Students interested in these programs should see their department advisor, visit the Foundation Coalition Office in ECG 303, call 480/965-5350, or access the Web site at www.eas.asu.edu/~asufc.

Minority Engineering Program. The staff of the Minority Engineering Program (MEP) is available to assist the academic and professional development of prospective, newly admitted, and continuing students through a variety of support services. In addition, advice on financial aid, scholarships, and employment is provided. For more information, visit the MEP office in ECG 307, call 480/965-8275, or access the MEP Web site at www.eas.asu.edu/~omep.

Women in Applied Sciences and Engineering Program. The Women in Applied Sciences and Engineering (WISE) Program hosts seminars and workshops, and provides outreach programs to high school and community college students to acquaint students with a variety of technical careers. The WISE Center, in room ECG 214, is open for study groups, tutoring, and informal discussions. For more information, call 480/965-6882, or access the Web site at www.eas.asu.edu/~wise.

Honor Societies. Students in the College of Engineering and Applied Sciences are encouraged to seek information concerning entry into those honor societies for which they may qualify. Membership in such organizations enhances the student's professional stature. The following honor societies are active within the college:

Alpha Pi Mu—Industrial Engineering Honor Society
Chi Epsilon—Civil Engineering Honor Society
Eta Kappa Nu—Electrical Engineering Honor Society
Pi Tau Sigma—Mechanical Engineering Honor Society
Sigma Gamma Tau—Aerospace Engineering Honor Society
Sigma Lambda Chi—Construction Honor Society
Tau Beta Pi—National Engineering Honor Society
Upsilon Pi Epsilon—National Computer Science Honor Society

Information on any of these organizations may be obtained from the respective department or school offices.

Honors Students. The College of Engineering and Applied Sciences participates in the programs of the Barrett Honors College, which provides enhanced educational experiences to academically superior undergraduate students. Participating students can major in any academic program. A description of the requirements and the opportunities offered by the Barrett Honors College can be found in "Curriculum," page 112.

Scholarships. Information and applications for academic scholarships for continuing students may be obtained by contacting the college's Student Academic Services or the various department or school offices. Other scholarships may be available through the university Student Financial Assistance Office. For application and more information, access the Web site at www.eas.asu.edu/sas.

ROTC. Students pursuing a commission through either the Air Force or Army ROTC programs are required to take courses in the Department of Aerospace Studies or Department of Military Science. To preclude excessive overloads, these students should plan on at least one additional semester to complete degree requirements. Because of accreditation requirements, aerospace studies (AES) or military science (MIS) courses are not acceptable for degree credit in engineering as social and behavioral science or humanities and fine arts under General Studies. ROTC students must also meet all other degree requirements of this college.

GENERAL INFORMATION

Definition of Terms. The terms used in this college to describe offerings are defined below for purposes of clarity.

Program of Study. This broad term describes the complete array of courses included in the study leading to a degree.

Major. This term describes a specialized group of courses contained within the program of study. Example: program of study—engineering; major—Civil Engineering.

Area of Study (Technical Electives) or Concentration. Each of these terms describes a selection of courses within a major or among one or more majors. The number of technical electives varies from curriculum to curriculum. In several majors, the technical electives must be chosen from preselected groups. For this reason the choice of specific technical electives for an area of study should be made with the advice and counsel of an advisor. Example: major—Mechanical Engineering; area of study—thermosciences.

Del E. Webb School of Construction

William W. Badger
Director
 (SCOB 241) 480/965-3615
 ceaspub.eas.asu.edu/dewsc

PROFESSORS

BADGER, MULLIGAN

ASSOCIATE PROFESSORS

BASHFORD, DUFFY, ERNZEN, KASHIWAGI,
 SAWHNEY, WALSH, WEBER

ASSISTANT PROFESSORS

CHASEY, KNUTSON, WIEZEL

VISITING EMINENT SCHOLAR

SCHEXNAYDER

PURPOSE

Construction careers are so broadly diversified that no single curriculum prepares the student for universal entry into all fields. As an example, heavy construction contractors usually place more emphasis on technical and engineering science skills than do residential contractors/developers, who usually prefer a greater depth of knowledge in management and construction. To ensure a balanced understanding of the technical, professional, and philosophical standards that distinguish modern-day constructors, advisory groups representing leading associations of contractors and builders provide counsel in curriculum development. Construction has a common core of engineering science, management, and behavioral courses on which students may build defined concentrations to suit individual backgrounds, aptitudes, and objectives. These concentrations are not absolute but generally match major divisions of the construction industry.

DEGREES

Construction—B.S.

The faculty in the Del E. Webb School of Construction offer the B.S. degree in Construction. Four concentrations are available: general building construction, heavy construction, residential construction, and specialty construction.

Each concentration is arranged to accent requisite technical skills and to develop management, leadership, and competitive qualities in the student. Prescribed are a combination of General Studies courses, technical courses basic to engineering and construction, and courses on a broad range of applied management subjects fundamental to the business of construction contracting.

Construction—M.S.

The faculty in the school also offer the M.S. degree in Construction. Details for this degree are found in the *Graduate Catalog*.

Professional Accreditation and Affiliations. The Del E. Webb School of Construction is a member of the Associated Schools of Construction, an organization dedicated to the development and advancement of construction education. The construction program is accredited by the American Council for Construction Education.

SPECIAL PROGRAMS

The Del E. Webb School of Construction maintains a cooperative agreement with community colleges within Arizona and also with selected out-of-state colleges and universities to structure courses that are directly transferable into the construction program at ASU.

Student Organizations. The school has a chapter of Sigma Lambda Chi, a national honor society that recognizes high academic achievement in accepted construction programs. The school is also host to the Associated General Contractors of America student chapter, the National Association of Home Builders student chapter, and the Construction Women's Alliance.

Scholarships. Apart from those given by the university, a number of scholarships from the construction industry are awarded to students registered in the construction program. The scholarships are awarded on the basis of academic achievement and participation in activities of the construction program.

ADMISSION

For information regarding requirements for admission, transfer, retention, qualification, and reinstatement, see "Undergraduate Admission," page 54; "Admission," page 201; and "College Degree Requirements," page 203. A preprofessional category is available for applicants deficient in regular admission requirements. Vocational and craft-oriented courses taught at the community colleges are not accepted for credit toward a bachelor's degree in Construction.

BASIC REQUIREMENTS

Students complete the following basic requirements before registering for advanced courses: (1) All first-semester, first-year courses and the university First-Year Composition requirement (see "University Graduation Requirements," page 74) must be completed by the time the student has accumulated 48 semester hours of program requirements, and (2) all second-semester, first-year courses must be completed by the time the student has completed 64 semester hours of program requirements. Transfer students are given a one-semester waiver. Participation in a summer field internship activity is required for all students between the second and third years of the program.

Any student not making satisfactory progress is permitted to register for only those courses required to correct any deficiencies.

DEGREE REQUIREMENTS

A minimum of 128 semester hours with at least 50 hours at the upper-division level is required for graduation in

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

general building construction, heavy construction, residential construction, and specialty construction. Students in all concentrations are required to complete a construction core of science-based engineering, construction, and management courses.

GRADUATION REQUIREMENTS

A student must earn a grade of “C” or higher in the mathematics and physics courses listed in the program of study.

In addition to fulfilling school and major requirements, majors must satisfy the General Studies requirements as noted in “General Studies,” page 78, and all university graduation requirements as noted in “University Graduation Requirements,” page 74. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

SCHOOL COURSE REQUIREMENTS

The school requires that the General Studies requirement be satisfied in the following manner:

Humanities and Fine Arts/Social and Behavioral Sciences

CON 101 Construction and Culture: A Built Environment <i>HU, G, H</i>	3
ECN 111 Macroeconomic Principles <i>SB</i>	3
ECN 112 Microeconomic Principles <i>SB</i>	3
HU/SB and awareness area courses as needed	6
Total	15

Literacy and Critical Inquiry

COM 225 Public Speaking <i>L</i>	3
CON 496 Construction Contract Administration <i>L</i>	3
Total	6

Natural Sciences

PHY 111 General Physics <i>SQ</i> ¹	3
PHY 112 General Physics <i>SQ</i> ²	3
PHY 113 General Physics Laboratory <i>SQ</i> ¹	1
PHY 114 General Physics Laboratory <i>SQ</i> ²	1
Total	8

Mathematical Studies

MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
STP 226 Elements of Statistics <i>CS</i>	3
Total	7
General Studies/school requirements total ³	36

¹ Both PHY 111 and 113 must be taken to secure *SQ* credit.

² Both PHY 112 and 114 must be taken to secure *SQ* credit.

³ Because of the school’s requirement for MAT 270, the total semester hours exceed the General Studies requirement of 35.

Construction Major Requirements Common to All Concentrations (Except as Noted)

ACC 230 Uses of Accounting Information I	3
or ACC 394 ST: Financial Analysis and Accounting for Small Businesses (3)*	
CEE 340 Hydraulics and Hydrology	3
CON 221 Applied Engineering Mechanics: Statics	3
CON 243 Heavy Construction Equipment, Methods, and Materials	3
CON 251 Microcomputer Applications for Construction	3
CON 252 Building Construction Methods, Materials, and Equipment	3
CON 273 Electrical Construction Fundamentals	3

CON 296 Field Internship	0
CON 310 Testing of Materials for Construction	3
CON 323 Strength of Materials	3
CON 341 Surveying	3
CON 345 Mechanical Systems	3
CON 371 Construction Management and Safety	3
CON 383 Construction Estimating	3
CON 389 Construction Cost Accounting and Control <i>CS</i>	3
CON 424 Structural Design	3
CON 450 Soil Mechanics in Construction	3
CON 453 Construction Labor Management	3
CON 455 Construction Project Management	3
CON 463 Foundations	3
CON 495 Construction Planning and Scheduling <i>CS</i>	3
ECE 100 Introduction to Engineering Design <i>CS</i>	4
LES 305 Legal, Ethical, and Regulatory Issues in Business	3
or LES 306 Business Law (3) (ASU West)	
or LES 380 Consumer Perspective of Business Law (3)	4
Science elective with lab	4
Total common to all concentrations	71

* ACC 394 ST: Financial Analysis and Accounting for Small Businesses is recommended.

Advisor-approved alternates/transfer credits for these courses may vary from the total required semester hours indicated. Such variances do not reduce the minimum of 128 semester hours required for the degree.

The course work for the first two years is the same for all concentrations.

First Semester

CON 101 Construction and Culture: A Built Environment <i>HU, G, H</i>	3
ECN 111 Macroeconomic Principles <i>SB</i>	3
ENG 101 First-Year Composition	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
PHY 111 General Physics <i>SQ</i> ¹	3
PHY 113 General Physics Laboratory <i>SQ</i> ¹	1
Total	17

Second Semester

ECE 100 Introduction to Engineering Design <i>CS</i>	4
ECN 112 Microeconomic Principles <i>SB</i>	3
ENG 102 First-Year Composition	3
PHY 112 General Physics <i>SQ</i> ²	3
PHY 114 General Physics Laboratory <i>SQ</i> ²	1
HU elective with awareness area as needed	3
Total	17

Third Semester

CON 221 Applied Engineering Mechanics: Statics	3
CON 243 Heavy Construction Equipment, Methods, and Materials	3
CON 251 Microcomputer Applications for Construction	3
CON 273 Electrical Construction Fundamentals	3
STP 226 Elements of Statistics <i>CS</i>	3
Total	15

Fourth Semester

ACC 230 Uses of Accounting Information I	3
or ACC 394 ST: Financial Analysis and Accounting for Small Businesses ³ (3)	
COM 225 Public Speaking <i>L</i>	3
CON 252 Building Construction Methods, Materials, and Equipment	3
CON 323 Strength of Materials	3

Basic science elective with lab.....	4
Total	16

- ¹ Both PHY 111 and 113 must be taken to secure SQ credit.
- ² Both PHY 112 and 114 must be taken to secure SQ credit.
- ³ ACC 394 ST: Financial Analysis and Accounting for Small Businesses is recommended.

Concentration in General Building Construction

The general building construction concentration provides a foundation for students who wish to pursue careers as estimators, project managers, project engineers, and eventually, owners of firms engaged in the construction of residential, commercial, and institutional structures. Educational focus is on building systems required for the mass development and production of large-scale projects. General building construction is addressed as an integrated process from conception through delivery of completed facilities to users.

Requirements

CON 472 Development Feasibility Reports L.....	3
CON 483 Advanced Building Estimating	3
PUP 432 Planning and Development Control Law	3
or PUP 433 Zoning Ordinances, Subdivision Regulations, and Building Codes (3)	
REA 380 Real Estate Fundamentals	3
Upper-division technical elective	3
Total	15

Concentration in Heavy Construction

The heavy construction concentration prepares students for careers related to the public works discipline. Typical projects in which they are involved are highways, railroads, airports, power plants, rapid transit systems, process plants, harbor and waterfront facilities, pipelines, dams, tunnels, bridges, canals, sewerage and water works, and mass earth-work.

Requirements

CON 344 Route Surveying.....	3
CON 486 Heavy Construction Estimating	3
Upper-division business electives	6
Upper-division technical elective	3
Total	15

Concentration in Residential Construction

The residential construction concentration prepares students for careers in the residential sector of the industry. This concentration covers the specific methods and processes during the planning, production, marketing, and business-related activities common to residential construction.

Requirements

CON 377 Residential Construction Production Procedures.....	3
CON 477 Residential Construction Business Practices	3
CON 484 Internship	3
MKT 300 Principles of Marketing.....	3
PUP 432 Planning and Development Control Law	3
or PUP 433 Zoning Ordinances, Subdivision Regulations, and Building Codes (3)	
Total	15

Concentration in Specialty Construction

The specialty construction concentration prepares students for careers with specialty constructors, such as mechanical and electrical construction firms. It emphasizes the construction process at the trade contractor level.

Requirements

CON 468 Mechanical and Electrical Estimating	3
CON 471 Mechanical and Electrical Project Management.....	3
CON 494 ST: Cleanroom Construction	3
Upper-division business electives	6
Total	15

CONSTRUCTION (CON)

CON 101 Construction and Culture: A Built Environment. (3)

fall and spring

Analysis of the cultural context of construction, emphasizing its centrality in the evolution and expansion of built environments as expressions of ethical and historical value systems. Lecture, speakers.

General Studies: HU, G, H

CON 221 Applied Engineering Mechanics: Statics. (3)

fall and spring

Vectors, forces and moments, force systems, equilibrium, analysis of basic structures and structural components, friction, centroids, and moments of inertia. Prerequisites: MAT 270; PHY 111, 113.

CON 243 Heavy Construction Equipment, Methods, and Materials. (3)

fall and spring

Emphasis on "Horizontal" construction. Fleet operations, maintenance programs, methods, and procedures to construct tunnels, roads, dams, and the excavation of buildings. Lab, field trips.

CON 251 Microcomputer Applications for Construction. (3)

fall and spring

Applications of the microcomputer as a problem-solving tool for the constructor. Use of spreadsheets, information management, and multimedia software. Prerequisite: ECE 100.

CON 252 Building Construction Methods, Materials, and Equipment. (3)

fall and spring

Emphasis on "Vertical" construction. Methods, materials, codes, and equipment used in building construction corresponding to the 16 division "Master Format." Lecture, lab.

CON 273 Electrical Construction Fundamentals. (3)

fall and spring

Circuits and machinery. Power transmission and distribution, with emphasis on secondary distribution systems. Measurements and instrumentation. Lecture, field trips. Prerequisites: PHY 112, 114.

CON 296 Field Internship. (0)

summer

Students participate as interns on construction projects to observe and experience the daily activities. Internship.

CON 310 Testing of Materials for Construction. (3)

fall and spring

Structural and behavioral characteristics, engineering properties, measurements, and application of construction materials. Not open to engineering students. Lecture, lab. Prerequisite: CON 323.

CON 323 Strength of Materials. (3)

fall and spring

Analysis of strength and rigidity of structural members in resisting applied forces. Stress, strain, shear, moment, deflections, combined stresses, connections, and moment distribution. Both U.S. and SI units of measurement. Prerequisite: CON 221.

CON 341 Surveying. (3)

fall and spring

Theory and field work in construction and land surveys. Lecture, lab. Prerequisite: MAT 170.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CON 344 Route Surveying. (3)*spring*

Simple, compound, and transition curves, including reconnaissance, preliminary, and location surveys. Calculation of earthwork. Dimensional control for construction projects. Lecture, lab. Prerequisites: CON 243, 341.

CON 345 Mechanical Systems. (3)*fall and spring*

Design parameters and equipment related to heating and cooling systems for mechanical construction. Computer-aided calculations. Lecture, field trips. Prerequisites: CON 252; PHY 111, 113.

CON 371 Construction Management and Safety. (3)*fall and spring*

Organization and management theory applied to the construction process. Leadership functions. Safety procedures and equipment. OSHA requirements for construction. Prerequisite: CON 252.

CON 377 Residential Construction Production Procedures. (3)*spring*

Process used in residential construction. How a house is built: design, permits, scheduling, codes, contracting, site management, mechanical/electrical. Prerequisite: CON 252.

CON 383 Construction Estimating. (3)*fall and spring*

Drawings and specifications. Methods and techniques used in construction estimating procedures. Introduction to computer software used in industry. Lecture, project workshops. Prerequisites: a combination of CON 243 and 251 and 252 or only instructor approval.

CON 389 Construction Cost Accounting and Control. (3)*fall and spring*

Nature of construction cost. Depreciation and tax theory and variable equipment costs. Cash flow theory, investment models, profitability, and analysis. Computer applications. Funding sources and arrangements. Builder's insurance. Prerequisites: ACC 230 (or 394 ST: Financial Analysis and Accounting for Small Business); CON 251.

*General Studies: CS***CON 424 Structural Design. (3)***fall*

Economic use of concrete, steel, and wood in building and engineered structures. Design of beams, columns, concrete formwork, and connections. Lecture, field trips. Prerequisite: CEE 310.

CON 450 Soil Mechanics in Construction. (3)*fall and spring*

Soil mechanics as applied to the construction field, including foundations, highways, retaining walls, and slope stability. Relationship between soil characteristics and geologic formations. Not open to engineering students. Lecture, lab. Prerequisite: CON 323.

CON 453 Construction Labor Management. (3)*fall and spring*

Labor and management history, union, and open shop organization of building and construction workers; applicable laws and government regulations; goals, economic power, jurisdictional disputes, and grievance procedures. Lecture, lab. Prerequisites: CON 371; ECE 112.

CON 455 Construction Project Management. (3)*fall and spring*

Study of methods for coordinating people, equipment, materials, money, and schedule to complete a project on time and within approved cost. Lecture, class projects. Prerequisite: CON 371. Pre- or corequisite: CON 495.

CON 463 Foundations. (3)*spring*

Subsurface construction theory and practice for description, excavations, exploration, foundations, pavements, and slopes. Evaluation of specifications and plans of work. Lecture, recitation, field trips. Prerequisites: CEE 450; CON 424.

CON 468 Mechanical and Electrical Estimating. (3)*fall*

Analysis and organization of performing a cost estimate for both mechanical and electrical construction projects. Computer usage. Prerequisites: a combination of CON 273 and 345 and 383 or only instructor approval.

CON 471 Mechanical and Electrical Project Management. (3)*spring*

Specialty contracts and agreements, scheduling, material handling, labor unit analysis, and job costing for mechanical and electrical construction. Prerequisite: CON 371.

CON 472 Development Feasibility Reports. (3)*fall and spring*

Integration of economic location theory, development cost data, market research data, and financial analysis into a feasibility report. Computer orientation. Prerequisite: REA 380.

*General Studies: L***CON 477 Residential Construction Business Practices. (3)***fall*

Topics addressed include development, marketing, financing, legal issues, and sales. Prerequisite: CON 377 or instructor approval.

CON 483 Advanced Building Estimating. (3)*fall and spring*

Concepts of pricing and markup, development of historic costs, life cycle costing, change order and conceptual estimating, and emphasizing microcomputer methods. Prerequisite: CON 383.

CON 484 Internship. (1–12)*not regularly offered***CON 486 Heavy Construction Estimating. (3)***fall*

Methods analysis and cost estimation for construction of highways, bridges, tunnels, dams, and other engineering works. Lecture, field trips. Prerequisites: CON 344, 383.

CON 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Cleanroom Construction. (3)

*fall***CON 495 Construction Planning and Scheduling. (3)***fall and spring*

Various network methods of project scheduling, such as AOA, AON Pert, bar-charting, line-of-balance, and VPM techniques. Microcomputers used for scheduling, resource allocation, and time/cost analysis. Lecture, lab. Prerequisites: CON 383; STP 226. Pre- or corequisite: CON 389.

*General Studies: CS***CON 496 Construction Contract Administration. (3)***fall and spring*

Surveys administrative procedures of general and subcontractors. Studies documentation, claims, arbitration, litigation, bonding, insurance, and indemnification. Discusses ethical practices. Lecture, field trips. Prerequisites: COM 225 or ECE 300; senior standing.

*General Studies: L***CON 533 Strategies of Estimating and Bidding. (3)***fall*

Explores advanced concepts of the estimating process, such as modeling and statistical analysis, to improve bid accuracies. Prerequisite: CON 483 or 486 or instructor approval.

CON 540 Construction Productivity. (3)*fall*

Productivity concepts. Data collection. Analysis of productivity data and factors affecting productivity. Means for improving production and study of productivity improvement programs. Pre- or corequisite: CON 495.

CON 543 Construction Equipment Engineering. (3)*spring*

Analysis of heavy construction equipment productivity using case studies. Applies engineering fundamentals to the planning, selection, and utilization of equipment. Lecture, case studies.

CON 545 Construction Project Management. (3)*spring*

Theory and practice of construction project management. Roles of designer, owner, general contractor, and construction manager. Lecture, field trips. Pre- or corequisite: CON 495.

CON 547 Strategic Planning. (3)*fall*

Business planning process of the construction enterprise. Differences between publicly held and closely held businesses and their exposure.

CON 561 International Construction. (3)*spring*

Investigation of the cultural, social, economic, political, and management issues related to construction in foreign countries and remote regions.

CON 565 Performance-Based Systems. (3)*fall*

Identifying the multicriteria methodology in the procurement of facilities contractual work. Prerequisite: instructor approval.

CON 567 Advanced Procurement Systems. (3)*spring*

Development of multicriteria decision procurement model for selecting the performing contractor. Prerequisite: instructor approval.

CON 570 Cleanroom Construction I. (3)*fall*

Design issues for cleanroom facilities; the construction's viewpoint including planning, structures, mechanical, and tool installation. Lecture, site visits. Prerequisite: instructor approval.

CON 571 Cleanroom Construction II. (3)*spring*

Construction issues for cleanroom facilities including scheduling, cost estimating, project management, mechanical, safety certification, and tool hook-up. Lecture, site visits. Prerequisite: CON 570 or instructor approval.

CON 575 Information Technology in Construction. (3)*spring*

Use of information technology in the construction enterprise for improved communications, process modeling, and decision making. Prerequisite: instructor approval.

CON 589 Construction Company Financial Control. (3)*fall*

Financial accounting and cost control at the company level in construction companies. Accounting systems. Construction project profit calculations. Financial analysis. Lecture, case studies.

School of Engineering

Daniel F. Jankowski

Director

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PURPOSE

A large percentage of all engineering degree holders are found in leadership positions in a wide variety of industrial settings. Although an education in engineering is generally considered to be one of the best technical educations, it also provides an opportunity for the development of many additional attributes, including ethical and professional characteristics. In this era of rapid technological change, an engineering education serves society well as a truly liberal education. Society's needs in the decades ahead call for engineering contributions on a scale not previously experienced. The well-being of civilization as we know it may depend upon how effectively this resource is developed.

Students studying engineering at ASU are expected to acquire a thorough understanding of the fundamentals of mathematics and the sciences and their applications to the solution of problems in the various engineering fields. The program is designed to develop a balance between science and engineering and an understanding of the economic and social consequences of engineering activity. The goals include the promotion of the general welfare of the engineering profession.

The courses offered are designed to meet the needs of the following students:

1. those who wish to pursue a career in engineering;
2. those who wish to do graduate work in engineering;

3. those who wish to have one or two years of training in mathematics, applied science, and engineering in preparation for some other technical career;
4. those who desire preengineering for the purpose of deciding which program to undertake or those who desire to transfer to another college or university; and
5. those who wish to take certain electives in engineering while pursuing another program in the university.

ADMISSION

For information regarding requirements for admission, transfer, retention, disqualification, and reinstatement, see "Undergraduate Admission," page 54; "Admission," page 201; "College Degree Requirements," page 203; and "Academic Standards," page 204.

Individuals who are beginning their initial college work in the School of Engineering should have completed certain secondary school units in addition to the minimum university admission requirements. Four units are required in mathematics; a course with trigonometry should be included. The laboratory sciences chosen must include at least one unit in physics and one unit in chemistry. Calculus, biology, and computer programming are also recommended. Students who do not meet the college's subject matter requirements may be required to complete additional university course work that may not apply toward an engineering degree. One or more of the courses—CHM 113 General Chemistry, CSE 181 Applied Problem Solving with Visual BASIC, MAT 170 Precalculus, and PHY 105 Basic Physics—may be required to satisfy omissions or deficiencies upon admission.

DEGREES

The Bachelor of Science in Engineering (B.S.E.) degree consists of three parts:

1. university requirements (e.g., General Studies, First-Year Composition);
2. an engineering core; and
3. a major.

The courses identified for each of these parts are intended to meet requirements imposed by the university and by the professional accrediting agency, Accreditation Board for Engineering and Technology, Inc. (ABET), for programs in engineering.

The B.S. degree in Computer Science consists of two parts: (1) university requirements (e.g., General Studies, First-Year Composition); and (2) a major.

The courses identified for each of these parts are intended to meet requirements imposed by the university and by the professional accrediting agency, the Computer Science Accreditation Board (CSAB), for programs in computing science.

In addition to First-Year Composition, the university requires, through the General Studies requirement, courses in literacy and critical inquiry, humanities and fine arts, social and behavioral sciences, mathematical studies, and

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

natural sciences (see “General Studies,” page 78). There are also requirements for historical awareness, global awareness, and cultural diversity in the United States. ABET and CSAB impose additional requirements, particularly in mathematics and the basic sciences and in the courses for the major.

The engineering core is an organized body of knowledge that serves as a foundation to engineering and to specialized studies in a particular engineering major.

The courses included in the engineering core are taught in such a manner that they serve as basic background material (1) for all engineering students who will be taking subsequent work in the same and related subject areas; and (2) for those students who may not desire to pursue additional studies in a particular subject area. Thus, subjects within the engineering core are taught with an integrity and quality appropriately relevant to the particular discipline but always with an attitude and concern for both engineering in general and for the particular major(s).

The majors available are of two types: (1) those associated with a particular department within the School of Engineering (for example, Electrical Engineering and Civil Engineering) and (2) those offered as concentrations in Engineering Special Studies (for example, premedical engineering). With the exception of the Computer Science major, all curricula are extensions beyond the engineering core and cover a wide variety of subject areas within each field. Some of the credits in the major are reserved for the student’s use as an area of study. These credits are traditionally referred to as *technical electives*.

Majors and areas of study are offered by the seven departments:

- Bioengineering
- Chemical and Materials Engineering
- Civil and Environmental Engineering
- Computer Science and Engineering
- Electrical Engineering
- Industrial Engineering
- Mechanical and Aerospace Engineering

The major in Engineering Special Studies is administered by the Office of the Dean. Engineering Special Studies makes use of the general structure of the engineering curricula noted above and provides students with an opportunity for study in engineering concentrations not available in the traditional engineering curricula at ASU.

The first two years of study are concerned primarily with general education requirements, English proficiency, and the engineering core. The final two years of study are concerned with the engineering core and the major, with a considerable part of the time being spent on the major.

The semester-by-semester selection of courses may vary from one field to another, particularly at the upper-division level, and is determined by the student in consultation with a faculty advisor. An example of a typical full-time freshman-year schedule is shown below; depending on a particular student’s circumstances, many other examples are possible.

Typical Freshman Year

CHM 114 General Chemistry for Engineers SQ	4
ECE 100 Introduction to Engineering Design CS	4
ECN 111 Macroeconomic Principles SB	3
or ECN 112 Microeconomic Principles SB (3)	

ENG 101 First-Year Composition	3
ENG 102 First-Year Composition	3
MAT 270 Calculus with Analytic Geometry I MA	4
MAT 271 Calculus with Analytic Geometry II MA	4
PHY 121 University Physics I: Mechanics SQ*	3
PHY 122 University Physics Laboratory I SQ*	1
HU/SB and awareness area course	3
Total	32

* Both PHY 121 and 122 must be taken to secure SQ credit.

Well-prepared students who have no outside commitments can usually complete the program of study leading to an undergraduate degree in engineering in four years (eight semesters at 16 semester hours per semester). Many students, however, find it advantageous or necessary to devote more than four years to the undergraduate program by pursuing, in any semester, fewer studies than are regularly prescribed. Where omissions or deficiencies exist—e.g., in chemistry, computer programming, English, mathematics, and physics—the student must complete more than the minimum of 128 semester hours. Therefore, in cases of inadequate secondary preparation, poor health, or financial necessity requiring considerable time for outside work, the undergraduate program is extended beyond four years.

DEGREE REQUIREMENTS

The degree programs in engineering at ASU are intended to develop habits of quantitative thought having equal utility for both the practice of engineering and other professional fields. In response to the opportunities provided by changing technology, educational research, and industrial input, possible improvements of various aspects of these programs are routinely considered. It is the intent of the faculty that all students be appropriately prepared in the four areas described below.

1. *Oral and written English.* Communication skills are an essential component of an engineering education. All engineering students must complete the university First-Year Composition requirement (see “University Graduation Requirements,” page 74), and the literacy and critical inquiry component (see “Five Core Areas,” page 78) of the General Studies requirement, which involves two courses beyond First-Year Composition.
2. *Selected nonengineering topics.* This area ensures that the engineering student acquires a satisfactory level of basic knowledge in the humanities and fine arts, social and behavioral sciences, mathematical studies, and the natural sciences. Courses in these subjects give engineers an increased awareness of their social responsibilities, provide an understanding of related factors in the decision-making process, and also provide a foundation for the study of engineering. Required courses go toward fulfilling the General Studies requirement. Additional courses in mathematics and the basic sciences are selected to meet ABET requirements.

Because of accreditation requirements, aerospace studies (AES) and military science (MIS) courses are not acceptable for engineering degree credit in fulfilling the humanities and fine arts and social and

behavioral science portions of the General Studies requirement.

3. *Selected engineering topics.* This area involves courses in engineering science and engineering design. The courses further develop the foundation for the study of engineering and provide the base for specialized studies in a particular engineering discipline. The specific courses are included in the engineering core and in the major. While some departmental choices are allowed, all students are required to take ECE 100 Introduction to Engineering Design and ECE 300 Intermediate Engineering Design as part of the engineering core. These courses, together with other experiences in the engineering core and in the major, serve to integrate the study of design, the “process of devising a system, component, or process to meet desired needs” (ABET), throughout the engineering curricula.
4. *Specific engineering discipline.* This area provides a depth of understanding of a more definitive body of knowledge that is appropriate for a specific engineering discipline. Courses build upon the background provided by the earlier completed portions of the curriculum and include a major design experience as well as technical electives that may be selected by the student with the assistance of an advisor. The catalog material for the individual engineering majors describes specific departmental requirements.

COURSE REQUIREMENTS

A summary of the degree requirements is as follows:

First-Year Composition.....	6
General Studies/school requirements.....	57
Engineering core.....	15-19
Major (including area of study or concentration)*.....	46-50
Minimum total	128

* The requirements for each of the majors offered are described on the following pages.

The specific course requirements for the B.S. and B.S.E. degrees follow.

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
— or —	
ENG 105 Advanced First-Year Composition (3)	
Elective chosen with an advisor (3)	
— or —	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i> ¹	
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Macroeconomic Principles <i>SB</i> (3)	
HU courses.....	6 or 9
SB course(s).....	6 or 3
Total	15
<i>Literacy and Critical Inquiry</i>	
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 400 Engineering Communications <i>L</i>	3
or approved department L course (3)	
Total	6
<i>Mathematical Studies</i>	
ECE 100 Introduction to Engineering Design <i>CS</i>	4
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3
Department mathematics elective	2
Total	21
<i>Natural Sciences/Basic Sciences</i>	
CHM 114 General Chemistry for Engineers <i>SQ</i>	4
or CHM 116 General Chemistry <i>SQ</i> (4)	
PHY 121 University Physics I: Mechanics <i>SQ</i> ²	3
PHY 122 University Physics Laboratory I <i>SQ</i> ²	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ³	3
PHY 132 University Physics Laboratory II <i>SQ</i> ³	1
Department basic science elective	3
Total	15
General Studies/school requirements total.....	57

¹ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU or SB requirements.

² Both PHY 121 and 122 must be taken to secure SQ credit.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

Engineering Core Requirement

A minimum of five of the following eight courses are required. Courses selected are subject to departmental approval. See department requirements.

ECE 201 Electrical Networks I	4
ECE 210 Engineering Mechanics I: Statics.....	3
ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 313 Introduction to Deformable Solids.....	3
ECE 334 Electronic Devices and Instrumentation	4
ECE 340 Thermodynamics ¹	3
or MSE 430 Thermodynamics of Materials (3)	
ECE 350 Structure and Properties of Materials ²	3
or ECE 351 Civil Engineering Materials (3)	
or ECE 352 Properties of Electronic Materials (4)	
Choose one microcomputer/microprocessor course below	3 or 4
BME 470 Microcomputer Applications in Bioengineering (4)	
CHE 461 Process Control <i>CS</i> (4)	
CSE 225 Assembly Language Programming and Microprocessors (Motorola) (4)	
or EEE 225 Assembly Language Programming and Microprocessors (Motorola) (4)	

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

- CSE 226 Assembly Language Programming and Microprocessors (Intel) (4)
or EEE 226 Assembly Language Programming and Microprocessors (Intel) (4)
- IEE 463 Computer-Aided Manufacturing and Control CS (3)

¹ CHM 345 Physical Chemistry I (3) may be substituted for ECE 340.

² CHM 346 Physical Chemistry II (3) may be substituted for ECE 350.

GRADUATION REQUIREMENTS

To qualify for graduation from the School of Engineering, a student must have a minimum cumulative GPA of 2.00 in addition to having a GPA of at least 2.00 for the courses in the major field.

PROFESSIONAL ACCREDITATION

The undergraduate programs in Aerospace Engineering, Bioengineering, Chemical Engineering, Civil Engineering, Computer Systems Engineering, Electrical Engineering, Industrial Engineering, Materials Science and Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, Baltimore, Maryland, 410/347-7700. The B.S. program in Computer Science is accredited by the Computer Science Accreditation Commission of CSAB.

ANALYSIS AND SYSTEMS (ASE)

ASE 100 College Adjustment and Survival. (2)

fall and spring

Exploration of career goals and majors. Emphasis on organization and development of study skills, including time management, stress management, and use of the library.

ASE 194 Special Topics. (1–4)

fall

Possible topics:

- (a) MEP Academic Success. (2)

ASE 399 Cooperative Work Experience. (1)

fall, spring, summer

Work periods with industrial firms or government agencies alternated with full-time course work. Not open to students from other colleges. May be repeated for credit. Prerequisites: 45 hours completed in major with 2.50 GPA; dean approval.

ASE 485 Engineering Statistics. (3)

fall, spring, summer

Designing statistical studies for solutions to engineering problems. Methods include regression, design and analysis of experiments, and other statistical topics. Prerequisite: ECE 380.

General Studies: CS

ASE 490 Project in Design and Development. (2–3)

fall, spring, summer

Individual project in creative design and synthesis. May be repeated for credit. Prerequisite: senior standing.

ASE 496 Professional Seminar. (0)

fall and spring

Topics of interest to students in the engineering special and interdisciplinary studies.

ASE 500 Research Methods: Engineering Statistics. (3)

fall, spring, summer

Designing statistical studies for solutions to engineering problems. Methods include regression, design and analysis of experiments, and other statistical topics. Prerequisite: ECE 380.

ASE 582 Linear Algebra in Engineering. (3)

fall

Development and solution of systems of linear algebraic equations. Applications from mechanical, structural, and electrical fields of engineering. Prerequisite: MAT 242 (or its equivalent).

ASE 586 Partial Differential Equations in Engineering. (3)

spring

Development and solution of partial differential equations in engineering. Applications in solid mechanics, vibrations, and heat transfer. Prerequisites: ECE 386; MAT 242, 274.

ENGINEERING CORE (ECE)

ECE 100 Introduction to Engineering Design. (4)

fall and spring

Introduction to engineering design; teaming; the profession of engineering; computer models in engineering; communication skills; quality and customer satisfaction. Prerequisites: high school computing and physics and algebra courses (or their equivalents).

General Studies: CS

ECE 194 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Introduction to Engineering Design I. (2)

fall

- (b) Introduction to Engineering Design II. (2)

spring

ECE 201 Electrical Networks I. (4)

fall, spring, summer

Introduction to electrical networks. Component models, transient, and steady-state analysis. Lecture, lab. Prerequisite: ECE 100 or 194 (ST: Introduction to Engineering Design I and ST: Introduction to Engineering Design II) or 294 (ST: Elements of Engineering Design). Pre- or corequisites: MAT 274; PHY 131, 132.

ECE 210 Engineering Mechanics I: Statics. (3)

fall, spring, summer

Force systems, resultants, equilibrium, distributed forces, area moments, fluid statics, internal stresses, friction, energy criterion for equilibrium, and stability. Lecture, recitation. Prerequisites: ECE 100 or 194 (ST: Introduction to Engineering Design I and ST: Introduction to Engineering Design II) or 294 (ST: Elements of Engineering Design); MAT 271 (or 291); PHY 121, 122.

ECE 212 Engineering Mechanics II: Dynamics. (3)

fall, spring, summer

Kinematics and kinetics of particles, translating and rotating coordinate systems, rigid body kinematics, dynamics of systems of particles and rigid bodies, and energy and momentum principles. Lecture, recitation. Prerequisites: ECE 210; MAT 274.

ECE 214 Engineering Mechanics. (4)

fall, spring, summer

Force systems, resultants, moments and equilibrium. Kinematics and kinetics of particles, systems of particles and rigid bodies. Energy and momentum principles. Lecture, recitation. Prerequisites: ECE 100 or 194 (ST: Introduction to Engineering Design I and ST: Introduction to Engineering Design II) or 294 (ST: Elements of Engineering Design); MAT 274; PHY 121, 122.

ECE 294 Special Topics. (1–4)

not regularly offered

Possible topics:

- (a) Elements of Engineering Design

ECE 300 Intermediate Engineering Design. (3)

fall, spring, summer

Engineering design process concentrating on increasing the student's ability to prepare well-written technical communication and to define problems and generate and evaluate ideas. Teaming skills enhanced. Prerequisites: ECE 100 or 194 (ST: Introduction to Engineering Design I and ST: Introduction to Engineering Design II) or 294 (ST: Elements of Engineering Design); ENG 102 (or 105 or 108); at least two other engineering core courses.

General Studies: L

ECE 313 Introduction to Deformable Solids. (3)

fall, spring, summer

Equilibrium, strain-displacement relations, and stress-strain-temperature relations. Applications to force transmission and deformations in axial, torsional, and bending of bars. Combined loadings. Lecture, recitation. Prerequisites: ECE 210 (or 214); MAT 274.

ECE 334 Electronic Devices and Instrumentation. (4)*fall, spring, summer*

Applies electric network theory to semiconductor circuits. Diodes/transistors/amplifiers/opamps/digital logic gates, and electronic instruments. Lecture, lab. Prerequisite: ECE 201.

ECE 340 Thermodynamics. (3)*fall, spring, summer*

Work, heat, and energy transformations and relationships between properties; laws, concepts, and modes of analysis common to all applications of thermodynamics in engineering. Lecture, recitation. Prerequisites: CHM 114 (or 116); ECE 210 (or 214); PHY 131, 132. Pre- or corequisite: MAT 274.

ECE 350 Structure and Properties of Materials. (3)*fall, spring, summer*

Basic concepts of material structure and its relation to properties. Application to engineering problems. Prerequisites: CHM 114 (or 116); PHY 121, 122.

ECE 351 Civil Engineering Materials. (3)*fall and spring*

Structure and behavior of civil engineering materials. Laboratory investigations and test criteria. Lecture, lab. Prerequisite: ECE 313.

ECE 352 Properties of Electronic Materials. (4)*fall, spring, summer*

Schrodinger's wave equation, potential barrier problems, bonds of crystals, the band theory of solids, semiconductors, superconductor dielectric, and magnetic properties. Prerequisites: CHM 114 (or 116); MAT 274; PHY 241.

ECE 380 Probability and Statistics for Engineering Problem Solving. (3)*fall and spring*

Applications-oriented course with computer-based experience using statistical software for formulating and solving engineering problems. 2 hours lecture, 2 hours lab. Prerequisite: MAT 271.

*General Studies: CS***ECE 384 Numerical Methods for Engineers. (4)***fall and spring*

Numerical methods and computational tools for selected problems in engineering. Prerequisites: ECE 100 or 194 (ST: Introduction to Engineering Design I and ST: Introduction to Engineering Design II) or 294 (ST: Elements of Engineering Design); MAT 274; at least two other engineering core courses. Pre- or corequisite: MAT 272.

ECE 394 Special Topics. (1–4)*fall and spring*

Possible topics:

- Conservation Principles. (4)
- Engineering Systems. (4)
- Introduction to Manufacturing Engineering. (3)
- Properties that Matter. (4)

ECE 400 Engineering Communications. (3)*fall, spring, summer*

Planning and preparing engineering publications and oral presentations, based on directed library research related to current engineering topics. Prerequisites: ENG 102 (or 105 or 108); completion of General Studies L requirement (or ECE 300); senior standing in an engineering major.

*General Studies: L***SOCIETY, VALUES, AND TECHNOLOGY (STE)****STE 208 Patterns in Nature. (4)***fall and spring*

Project-oriented science course with computer training to develop critical thinking and technical skills for student-oriented science lessons K–12. Lecture, lab. Cross-listed as PHS 208. Credit is allowed for only PHS 208 or STE 208. Prerequisite: college-level science course or instructor approval.

*General Studies: SQ***Department of Bioengineering****Eric J. Guilbeau***Chair***(ECG 202) 480/965-3028****www.eas.asu.edu/~bme****PROFESSORS**

GUILBEAU, TOWE

ASSOCIATE PROFESSORS

GARCIA, HE, KIPKE, MASSIA, PIZZICONI

SWEENEY, YAMAGUCHI

ASSISTANT PROFESSORS

MUTHUSWAMY, PANITCH, VERNON

ACADEMIC PROFESSIONAL

BRANDON

The faculty in the Department of Bioengineering offer the B.S.E. degree in Bioengineering. The major builds on a broad base of knowledge within the basic and mathematical sciences and the engineering core. The major offers graduate excellent career opportunities.

Faculty within the department also participate in the Engineering Special Studies program in premedical engineering, which is described separately in "Programs in Engineering Special Studies," page 263.

BIOENGINEERING—B.S.E.

Bioengineering (synonyms: biomedical engineering, medical engineering) is the discipline of engineering that applies principles and methods from engineering, the physical sciences, the life sciences, and the medical sciences to understand, define, and solve problems in medicine, physiology, and biology. The mission of the bioengineering program at ASU is to educate students to use engineering and scientific principles and methods to develop instrumentation, materials, diagnostic and therapeutic devices, artificial organs, or other equipment and technologies needed in medicine and biology and to discover new fundamental principles regarding the functioning and structure of living systems. The overall goal of the program is to produce high-quality graduates with a broad-based education in engineering and the life and natural sciences who are well prepared for further graduate study in bioengineering, a career in the medical device or biotechnology industries, a career in biomedical research, or entry into a medical or other health profession school.

The program's mission is achieved by having its faculty and graduate teachers fulfill the following objectives: to provide students with a strong foundation in mathematics, the physical and life sciences, and basic engineering; and to give students a balance of theoretical understanding and ability in order to apply modern techniques, skills, and tools for problem solving at the interface of engineering with the biological and medical sciences. Students demonstrate an

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ability to make measurements on and interpret data from living systems, addressing the problems associated with the interaction between living and nonliving materials and systems. Students are able to design systems, devices, components, processes, and experiments with an understanding of manufacturing processes to meet real-world needs for solutions to problems in the biomedical device industries, medicine, and the life sciences. Students are able to communicate effectively as bioengineers in oral, written, computer-based, and graphical forms. Faculty seek to instill students with a sense of commitment to professionalism and ethical responsibility as bioengineers. Students are given opportunities to interact with and gain real-world experience with local and national medical device and technology industries, health-care organizations, educational institutions, and constituent populations. Faculty seek to develop within students an understanding of and positive approach toward continued lifelong learning of new technologies and relevant issues in the discipline of bioengineering.

Graduate degree programs in Bioengineering are offered at ASU at the master's and doctoral levels. For more information, consult the *Graduate Catalog*.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is necessary for the B.S.E. degree in Bioengineering. A minimum of 50 upper-division semester hours is required. Students must attain a GPA of at least 2.00 for the courses in the major field.

GRADUATION REQUIREMENTS

In addition to fulfilling school and major requirements, students must satisfy all university graduation requirements. See "University Graduation Requirements," page 74.

COURSE REQUIREMENTS

The course work, in semester hours, for the undergraduate degree can be classified into the following categories:

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
— or —	
ENG 105 Advanced First-Year Composition (3)	
Elective chosen with an advisor (3)	
— or —	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i>	
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
HU/ <i>SB</i> and awareness area courses	12
Total	15
<i>Literacy and Critical Inquiry</i>	
BME 413 Biomedical Instrumentation <i>L</i>	3
BME 423 Biomedical Instrumentation Laboratory <i>L</i>	1
ECE 300 Intermediate Engineering Design <i>L</i>	3
Total	7

Natural Sciences/Basic Sciences

CHM 113 General Chemistry <i>SQ</i>	4
CHM 116 General Chemistry <i>SQ</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
Total	16

Mathematical Studies

ECE 100 Introduction to Engineering Design <i>CS</i>	4
MAT 242 Elementary Linear Algebra	2
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	21
General Studies/school requirements total	59

Engineering Core

ECE 201 Electrical Networks I	4
ECE 210 Engineering Mechanics I: Statics	3
ECE 334 Electronic Devices and Instrumentation	4
ECE 340 Thermodynamics	3
ECE 350 Structure and Properties of Materials	3
Total	17

Major

BIO 181 General Biology <i>SQ</i>	4
BME 201 Introduction to Bioengineering <i>L</i>	3
BME 318 Biomaterials	3
BME 331 Biomedical Engineering Transport I: Fluids	3
BME 334 Bioengineering Heat and Mass Transfer	3
BME 416 Biomechanics	3
BME 417 Biomedical Engineering Capstone Design I	3
BME 435 Physiology for Engineers	4
BME 470 Microcomputer Applications in Bioengineering	4
BME 490 Biomedical Engineering Capstone Design II	3
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
Technical electives	10
Minimum total	46

¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.

² Both PHY 131 and 132 must be taken to secure *SQ* credit.

The major BME courses require a grade of "C" or higher to advance in the program and to receive a baccalaureate degree.

Bioengineering Areas of Study

Students interested in a career in bioengineering may elect to emphasize biochemical engineering, bioelectric engineering, biomaterials engineering, biomechanical engineering, biomedical imaging engineering, biosystems engineering, molecular and cellular bioengineering, or premedical engineering in their studies.

Biochemical Engineering. This area is designed to strengthen the student's knowledge of chemistry and transport phenomena and is particularly well suited for students interested in biotechnology. Technical electives must include CHM 331 and 332 and BCH 361.

Bioelectric Engineering. This area is designed to strengthen the student's knowledge of electrical systems, electronics, and signal processing. Students considering a

career in bioelectric phenomena, biocontrol systems, medical instrumentation, noninvasive imaging, neural engineering, and electrophysiology should consider this area of study.

Technical electives must include the following:

BME 350 Signals and Systems for Bioengineers.....3 or EEE 303 Signals and Systems (3)	
BME 419 Biocontrol Systems.....3	
EEE 302 Electrical Networks II.....3	
Total	9

Biomaterials Engineering. This area integrates the student's knowledge of materials science and engineering with biomaterials science and engineering concepts for the design of materials intended to be used for the development of medical and diagnostic devices. It emphasizes structure-property relationships of engineering materials (metals, polymers, ceramics, and composites) and biological materials, biomaterial-host response phenomena, technical and regulatory aspects of biomaterials testing and evaluation. Students interested in careers in the biomaterials, medical device, or biotechnology industries should consider this area of study.

Technical electives must include the following:

MSE 353 Introduction to Materials Processing and Synthesis.....3	
MSE 355 Introduction to Materials Science and Engineering.....3	
MSE 470 Polymers and Composites.....3 or MSE 471 Introduction to Ceramics (3)	
Total	9

Biomechanical Engineering. This area is designed to strengthen the student's knowledge of mechanics and control theory. Students interested in careers related to biomechanical design, orthotic/prosthetic devices, rehabilitation engineering, and orthopedic implants should consider this area of study. It also provides the fundamentals for the study of neuromuscular control and the study of human motion. From the requirements given under "General Studies/School Requirements," page 213, either ECE 384 Numerical Analysis for Engineers I (2) or MAT 242 Elementary Linear Algebra (2) must be taken as the department mathematics elective.

Technical electives must include the following:

BME 350 Signals and Systems for Bioengineers.....3 or BME 419 Biocontrol Systems (3) or EEE 303 Signals and Systems (3)	
ECE 212 Engineering Mechanics II: Dynamics.....3	
ECE 313 Introduction to Deformable Solids.....3	
Total	9

Biomedical Imaging Engineering. This area is designed to strengthen the student's knowledge of radiation interactions, health physics, medical diagnostic imaging (MRI, PET, X-ray, CT), radiation protection, and nuclear instrumentation. Students considering careers in medical engineering or health physics should consider this area of study.

Technical electives must include the following:

PHY 361 Introductory Modern Physics.....3	
Department-approved electives.....6	
Total	9

Biosystems Engineering. This area is designed to strengthen the background of students interested in physiological systems modeling and analysis and design and evaluation of artificial organs and medical devices. Analyzing physiological systems and designing artificial organs require knowledge in integrating electrical, mechanical, transport, and thermofluid systems. Students considering careers in medical device industries, clinical engineering, or artificial organs should consider this area of study.

Technical electives must include the following:

BME 350 Signals and Systems for Bioengineers.....3 or BME 419 Biocontrol Systems (3)	
BME 411 Biomedical Engineering I.....3 or BME 412 Biomedical Engineering II (3)	
BME 415 Biomedical Transport Processes.....3	
Total	9

Molecular and Cellular Bioengineering. This area is designed to strengthen and integrate the student's knowledge of molecular and cellular biology, biochemistry, and biomaterials science and engineering for the design of biomolecular and cellular-based hybrid medical and diagnostic devices. It is particularly suited for students interested in pursuing graduate studies in molecular and cellular bioengineering and health-related biotechnology.

Technical electives must include the following:

BCH 361 Principles of Biochemistry.....3	
BIO 353 Cell Biology.....3	
CHM 331 General Organic Chemistry.....3	
Total	9

Premedical Engineering. This area is designed to meet the needs of students desiring entry into a medical, dental, or veterinary school. The course sequence provides an excellent background for advanced study leading to a career in research in the medical or life sciences.

Technical electives must include the following:

CHM 331 General Organic Chemistry.....3	
CHM 332 General Organic Chemistry.....3	
CHM 335 General Organic Chemistry Laboratory.....1	
CHM 336 General Organic Chemistry Laboratory.....1	
Total	8

To fulfill medical school admission requirements, BIO 182 General Biology is also required in addition to the degree requirements.

**Bioengineering Program of Study
Typical Four-Year Sequence**

First Year

First Semester

CHM 113 General Chemistry <i>SQ</i>	4
ECE 100 Introduction to Engineering Design <i>CS</i>	4
ENG 101 First-Year Composition	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total	15

Second Semester

CHM 116 General Chemistry <i>SQ</i>	4
ENG 102 First-Year Composition	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 272 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
Total	15

Second Year

First Semester

BIO 181 General Biology <i>SQ</i>	4
BME 201 Introduction to Bioengineering <i>L</i>	3
ECE 210 Engineering Mechanics I: Statics	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
Total	18

Second Semester

ECE 201 Electrical Networks I	4
ECE 350 Structure and Properties of Materials	3
MAT 274 Elementary Differential Equations <i>MA</i>	3
HU/SB and awareness area courses ³	6
Total	16

Third Year

First Semester

BME 331 Biomedical Engineering Transport I: Fluids	3
BME 435 Physiology for Engineers	4
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 340 Thermodynamics	3
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Macroeconomic Principles <i>SB</i> (3)	
MAT 242 Elementary Linear Algebra	2
Total	18

Second Semester

BME 318 Biomaterials	3
BME 334 Bioengineering Heat and Mass Transfer	3
ECE 334 Electronic Devices and Instrumentation	4
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
HU/SB and awareness area course ³	3
Total	16

Fourth Year

First Semester

BME 413 Biomedical Instrumentation <i>L</i>	3
BME 416 Biomechanics	3
BME 417 Biomedical Engineering Capstone Design I	3
BME 423 Biomedical Instrumentation Laboratory <i>L</i>	1
HU/SB and awareness area course ³	3
Technical elective(s)	4
Total	17

Second Semester

BME 470 Microcomputer Applications in Bioengineering	4
BME 490 Biomedical Engineering Capstone Design II	3
Technical electives	6
Total	13
Total degree requirements	128

¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.

² Both PHY 131 and 132 must be taken to secure *SQ* credit.

³ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU and SB requirements.

BIOENGINEERING (BME)

BME 201 Introduction to Bioengineering. (3)

fall and spring

Impact of bioengineering on society. Develops an awareness of the contributions of bioengineering to solve medical and biological problems. Prerequisite: ENG 101 or 102 or 105 or 108.

General Studies: L

BME 202 Global Awareness Within Biomedical Engineering Design. (3)

not regularly offered

Introduction to ethical, legal, social, economic, and technical issues arising from the design and implementation of bioengineering technology. Lecture, critical discourse. Prerequisites: ECE 100; ECN 111 (or 112); ENG 101 (or 105); 102.

General Studies: L/HU

BME 318 Biomaterials. (3)

spring

Material properties of natural and artificial biomaterials. Tissue and blood biocompatibility. Uses of materials to replace body parts. Prerequisite: ECE 350.

BME 331 Biomedical Engineering Transport: Fluids. (3)

fall

Transport phenomena with emphasis on biomedical engineering fluid systems. Prerequisites: MAT 274; PHY 131.

BME 334 Bioengineering Heat and Mass Transfer. (3)

spring

Application of the principles of heat and mass transfer phenomena to solution of problems in medicine and medical device design. Prerequisite: ECE 340. Prerequisite with a grade of "C" or higher: BME 331.

BME 350 Signals and Systems for Bioengineers. (3)

spring

Application of principles of calculus and ordinary differential equations to modeling and analysis of responses, signals, and signal transfers in biosystems. Prerequisites: ECE 301; MAT 272, 274.

BME 411 Biomedical Engineering I. (3)

once a year

Review of diagnostic and prosthetic methods using engineering methodology. Introduction to transport, metabolic, and autoregulatory processes in the human body. Prerequisite with a grade of "C" or higher: BME 334.

BME 412 Biomedical Engineering II. (3)

once a year

Review of electrophysiology and nerve pacing applications, introduction to biomechanics and joint/limb replacement technology, cardiovascular and pulmonary fluid mechanics, and the application of mathematical modeling. Prerequisite: instructor approval.

BME 413 Biomedical Instrumentation. (3)

fall

Principles of medical instrumentation. Studies of medical diagnostic instruments and techniques for the measurement of physiologic variables in living systems. Prerequisites: ECE 300, 334. Prerequisite with a grade of "C" or higher: BME 435. Corequisite: BME 423.

General Studies: L (if credit also earned in BME 423)

BME 415 Biomedical Transport Processes. (3)

once a year

Principles of momentum, heat, and mass transport with applications to medical and biological systems and medical device design. Prerequisites: MAT 274; PHY 131.

BME 416 Biomechanics. (3)*fall*

Mechanical properties of bone, muscle, and soft tissue. Static and dynamic analysis of human movement tasks such as locomotion. Prerequisite with a grade of "C" or higher: BME 318.

BME 417 Biomedical Engineering Capstone Design I. (3)*fall*

Technical, regulatory, economic, legal, social, and ethical aspects of medical device systems engineering design. Lecture, field trips. Prerequisite: ECE 300. Prerequisites with a grade of "C" or higher: BME 318, 334.

BME 419 Biocontrol Systems. (3)*fall*

Application of linear and nonlinear control systems techniques toward analysis of neuromusculoskeletal, cardiovascular, thermal, and mass transfer systems of the body. Prerequisites: ECE 301; MAT 274.

BME 423 Biomedical Instrumentation Laboratory. (1)*fall*

Laboratory experience with problems, concepts, and techniques of biomedical instrumentation in static and dynamic environments. Lab. Prerequisites: ECE 300, 334. Prerequisite with a grade of "C" or higher: BME 435. Corequisite: BME 413.

General Studies: L (if credit also earned in BME 413)

BME 435 Physiology for Engineers. (4)*fall*

Physiology of the nervous, muscular, cardiovascular, endocrine, renal, and respiratory systems. Emphasizes use of quantitative methods in understanding physiological systems. Lecture, lab. Prerequisites: a combination BIO 181 and CHM 116 and PHY 131 or only instructor approval.

BME 470 Microcomputer Applications in Bioengineering. (4)*spring*

Use of microcomputers for real-time data collection, analysis, and control of experiments involving actual and simulated physiological systems. Lecture, lab. Prerequisites: ECE 100, 334. Prerequisite with a grade of "C" or higher: BME 435.

BME 490 Biomedical Engineering Capstone Design II. (1–5)*spring*

Individual projects in medical systems or medical device design and development. Lecture, lab. Prerequisite with a grade of "C" or higher: BME 417.

BME 496 Professional Seminar. (1–3)*fall and spring*

Professional and ethical aspects with a discussion of responsibilities. Lecture, field trips. Prerequisite: instructor approval.

BME 511 Biomedical Engineering I. (3)*once a year*

Diagnostic and prosthetic methods using engineering methodology. Transport, metabolic, and autoregulatory processes in the body.

BME 512 Biomedical Engineering II. (3)*once a year*

Electrophysiology and nerve pacing applications, introduction to biomechanics and joint/limb replacement, technology, cardiovascular and pulmonary fluid mechanics, and mathematical modeling.

BME 513 Biomedical Instrumentation. (3)*fall*

Principles of medical instrumentation. Studies of medical diagnostic instruments and techniques for the measurement of physiologic variables in living systems.

BME 514 Advanced Biomedical Instrumentation. (3)*not regularly offered*

Principles of applied biophysical measurements using bioelectric and radiological approach. Prerequisites: ECE 334; MAT 274 (or its equivalent).

BME 515 Biomedical Transport Processes. (3)*not regularly offered*

Principles of momentum, heat, and mass transport with applications to medical and biological systems and medical device design. Prerequisite: instructor approval.

BME 516 Topics in Biomechanics. (3)*fall*

Mechanical properties of bone, muscle, and soft tissue. Static and dynamic analysis of human movement tasks, including in-depth project. Prerequisite: instructor approval.

BME 518 Introduction to Biomaterials. (3)*spring*

Topics include structure property relationships for synthetic and natural biomaterials, biocompatibility, and uses of materials to replace body parts. Prerequisite: ECE 350 (or its equivalent) or instructor approval.

BME 519 Topics in Biocontrol Systems. (3)*fall*

Linear and nonlinear control systems analysis of neuromusculoskeletal, cardiovascular, thermal, and mass transfer systems of the body, including in-depth project. Prerequisites: both ECE 301 and MAT 274 or only instructor approval.

BME 520 Bioelectric Phenomena. (3)*not regularly offered*

Study of the origin, propagation, and interactions of bioelectricity in living things; volume conductor problem, mathematical analysis of bioelectric interactions, and uses in medical diagnostics.

BME 521 Neuromuscular Control Systems. (3)*spring*

Overview of sensorimotor brain structures. Application of nonlinear, adaptive, optimal, and supervisory control theory to eye-head-hand coordination and locomotion.

BME 522 Biosensor Design and Application. (3)*once a year*

Theory and principles of biosensor design and application in medicine and biology. Principles of measurements with biosensors. Prerequisite: instructor approval.

BME 523 Physiological Instrumentation Lab. (1)*fall*

Laboratory experience with problems, concepts, and techniques of biomedical instrumentation in static and dynamic environments. Lab. Prerequisites: BME 435; ECE 334. Pre- or corequisite: BME 513.

BME 524 Fundamentals of Applied Neural Control. (3)*once a year*

Fundamental concepts of electrical stimulation and recording in the nervous system with the goal of functional control restoration. Pre- or corequisite: BME 435 or instructor approval.

BME 525 Surgical Techniques. (2)*spring*

Principles of surgical techniques, standard operative procedures, federal regulations, guidelines, and state-of-the-art methods. Lecture, lab.

BME 532 Prosthetic and Rehabilitation Engineering. (3)*once a year*

Analysis and critical assessment of design and control strategies for state-of-the-art medical devices used in rehabilitation engineering. Pre- or corequisite: BME 416 or 516 or EPE 610.

BME 533 Transport Processes I. (3)*fall*

Unified treatment of momentum, heat, and mass transfer from molecular theory, and continuum points of view. Continuum equations of microscopic and macroscopic systems and multicomponent and multiphase systems. Cross-listed as CHE 533. Credit is allowed for only BME 533 or CHE 533.

BME 534 Transport Processes II. (3)*spring*

Continuation of BME 533 or CHE 533, emphasizing mass transfer. Cross-listed as CHE 534. Credit is allowed for only BME 534 or CHE 534. Prerequisite: BME 533 or CHE 533.

BME 543 Thermodynamics of Chemical Systems. (3)*fall*

Classical and statistical thermodynamics of nonideal physicochemical systems and processes; prediction of optimum operating conditions. Cross-listed as CHE 543. Credit is allowed for only BME 543 or CHE 543.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

BME 544 Chemical Reactor Engineering. (3)*spring*

Reaction rates, thermodynamics, and transport principles applied to the design and operation of chemical reactors. Cross-listed as CHE 544. Credit is allowed for only BME 544 or CHE 544. Prerequisite: BME 543 or CHE 543.

BME 551 Movement Biomechanics. (3)*spring*

Mechanics applied to the analysis and modeling of physiological movements. Computational modeling of muscles, tendons, joints, and the skeletal system with application to sports and rehabilitation. Prerequisite: BME 416 or 516 or instructor approval.

BME 566 Medical Imaging Instrumentation. (3)*not regularly offered*

Design and analysis of imaging systems and nuclear devices for medical diagnosis, therapy, and research. Laboratory experiments using diagnostic radiology, fluoroscopy, ultrasound, and CAT scanning. Lecture, lab. Prerequisite: instructor approval.

BME 568 Medical Imaging. (3)*not regularly offered*

CT, SPECT, PET, and MRI. 3-dimensional *in vivo* measurements. Instrument design, physiological modeling, clinical protocols, reconstruction algorithms, and quantitation issues. Prerequisite: instructor approval.

Department of Chemical and Materials Engineering

Subhash Mahajan
Chair

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REGENTS' PROFESSOR MAYER

PROFESSORS

ADAMS, BERMAN, DEY, KRAUSE, MAHAJAN,
NEWMAN, RAUPP, SATER

ASSOCIATE PROFESSORS

ALFORD, BEAUDOIN, BECKMAN, BURROWS,
RIVERA, SIERKS

ASSISTANT PROFESSORS

ALLEN, CHAWLA, DILLNER, RAZATOS

The faculty in the Department of Chemical and Materials Engineering offer the B.S.E. degree in Chemical Engineering and in Materials Science and Engineering. Each of these majors builds on a broad base of knowledge within the basic and mathematical sciences and the engineering core. Each offers excellent career opportunities.

Chemical engineers design and operate processes that may include chemical change. They combine the science of chemistry with the discipline of engineering in order to solve complex problems in a wide variety of industries. Challenging job opportunities exist not only in the chemical and petroleum industries, but also in the plastics, electronics, computer, metals, space, food, drug, and health care industries. In these industries, chemical engineers practice in a wide variety of occupations including environmental control, surface treatments, energy and materials transformation, biomedical applications, fermentation, protein recovery, extractive metallurgy, and separations. In the envi-

ronmental area, chemical engineers develop methods to reduce the pollution created in manufacturing processes, devise techniques to recover usable materials from wastes, design waste storage and treatment facilities, and design pollution control strategies.

Materials science and engineering uses fundamental knowledge in chemistry and physics to correlate relationships between the structure and processing of materials and their properties. Students educated in this discipline decide how to optimize existing materials or how to develop new advanced materials and processing techniques. Students who major in materials science and engineering will find employment opportunities in a variety of industries and research facilities, which include aerospace, electronics, energy conversion, manufacturing, medical devices, semiconductors, and transportation.

CHEMICAL ENGINEERING—B.S.E.

Chemical engineers are generally concerned with transfer within and between liquid, gas, and solid phases and the chemical changes that may also occur. The engineers design and operate processes that accommodate such changes, including the chemical activation of materials. Typically this involves complex multicomponent systems wherein the interactions between species have to be considered and analyzed. The new challenge in chemical engineering is to apply the principles of fluid dynamics, mass transfer, solution thermodynamics, reaction kinetics, and separation techniques to technological endeavors such as pollution control within manufacturing and the environment, integrated circuit design, solid-state surface treatments, and materials processing.

Consequently, in addition to the chemical and petroleum industries, chemical engineers find challenging opportunities in the plastics, solid-state, electronics, computer, metals, space, food, drug, and health care industries, where they practice in a wide variety of occupations, such as environmental control, surface treatments, energy and materials transformations, biomedical applications, fermentation, protein recovery, extractive metallurgy, and separations. While a large percentage of the industrial positions are filled by graduates with bachelor's degrees, there are lucrative and creative opportunities in research and development for those who acquire postgraduate education.

Subspecializations have developed within the profession. However, the same broad body of knowledge is generally expected of all chemical engineers for maximum flexibility in industrial positions. The preparation for chemical engineering is accomplished by a blend of classroom instruction and laboratory experience.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is necessary for the B.S.E. degree in Chemical Engineering. A minimum of 50 upper-division semester hours is required. Students must attain a GPA of at least 2.00 for the courses in the major field.

GRADUATION REQUIREMENTS

In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See "University Graduation Requirements," page 74.



The college is committed to the development of research programs of national prominence.

John Phillips photo

COURSE REQUIREMENTS

The course work for the undergraduate degree can be classified into the following categories (in semester hours):

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
-----or-----	
ENG 105 Advanced First-Year Composition (3)	
Elective chosen with an advisor (3)	
-----or-----	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i>	
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
HU/ <i>SB</i> and awareness area courses ¹	12
Total	15
<i>Literacy and Critical Inquiry</i>	
CHE 352 Transport Laboratories <i>L</i>	3
ECE 300 Intermediate Engineering Design <i>L</i>	3
Total	6
<i>Natural Sciences/Basic Sciences</i>	
CHM 113 General Chemistry <i>SQ</i>	4
CHM 116 General Chemistry <i>SQ</i>	4
CHM 331 General Organic Chemistry	3

CHM 335 General Organic Chemistry Laboratory	1
PHY 121 University Physics I: Mechanics <i>SQ</i> ²	3
PHY 122 University Physics Laboratory I <i>SQ</i> ²	1
Total	16

Mathematical Studies

ECE 100 Introduction to Engineering Design <i>CS</i>	4
ECE 384 Numerical Methods for Engineers	4
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	23
General Studies/school requirements total	60

Engineering Core

CHE 342 Applied Chemical Thermodynamics	4
CHE 461 Process Control <i>CS</i>	4
ECE 394 ST: Conservation Principles	4
ECE 394 ST: Engineering Systems	4
ECE 394 ST: Properties that Matter	4
Total	20

Major

CHE 311 Introduction to Chemical Processing	3
CHE 331 Transport Phenomena I: Fluids	3
CHE 332 Transport Phenomena II: Energy Transfer	3
CHE 333 Transport Phenomena III: Mass Transfer	3
CHE 432 Principles of Chemical Engineering Design	3
CHE 442 Chemical Reactor Design	3
CHE 451 Chemical Engineering Laboratory	2
CHE 462 Process Design	3
CHM 332 General Organic Chemistry	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ECE 380 Probability and Statistics for Engineering Problem Solving CS.....	3
Technical electives	13
Total	42

¹ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU or SB requirements.

² Both PHY 121 and 122 must be taken to secure SQ credit.

Students should consult with their department academic advisors to ensure that all requirements are met.

The technical elective courses must be selected from upper-division courses with an advisor's approval and must include two three-semester-hour chemistry courses; a three-semester-hour natural science or materials course; and a three-semester-hour chemical engineering course.

To fulfill accreditation requirements and to prepare adequately for the advanced chemistry courses, Chemical Engineering majors are required to take the CHM 113 and 116 introductory chemistry sequence (CHM 117 and 118 are acceptable substitutes). Other freshman chemistry courses are *not acceptable*, and transfer students who have taken another chemistry course may be required to enroll in CHM 113 and 116.

Chemical Engineering Areas of Study

Students who wish to specialize may develop an area of interest through the use of technical electives and selective substitutions for required courses. Substitutions must be approved by the advisor and the Department Standards Committee and must be consistent with ABET accreditation criteria. No substitution of CHE 462 is allowed. The following are possible elective areas with suggested courses. A student may choose electives within the general department guidelines and does not have to select one of the areas listed.

Biochemical. Students wishing to prepare for a career in biotechnology, fermentation, food processing, pharmaceuticals, and other areas within biochemical engineering should select from the following:

Chemistry Electives

BCH 361 Principles of Biochemistry.....	3
BCH 461 General Biochemistry	3
BCH 462 General Biochemistry	3

Technical Electives

CHE 475 Biochemical Engineering.....	3
CHE 476 Bioreaction Engineering	3
CHE 477 Bioseparation Processes.....	3
CHE 494 ST: Biotechnology Techniques	3

Biomedical. Students who are interested in biomedical engineering but wish to maintain a strong, broad chemical engineering base should select from the following:

Chemistry Electives

BCH 361 Principles of Biochemistry.....	3
BCH 461 General Biochemistry	3
BCH 462 General Biochemistry	3

Technical Electives

BME 318 Biomaterials	3
BME 435 Physiology for Engineers.....	4

Environmental. Students interested in environmental engineering are encouraged to pursue a B.S.E. degree in Chemical Engineering with this area of study. Students interested

in the management of hazardous wastes and air and water pollution should select from the following:

Chemistry Electives

CHM 302 Environmental Chemistry	3
BCH 361 Principles of Biochemistry.....	3
BCH 461 General Biochemistry	3
CHM 481 Geochemistry	3
CHM 494 ST: Chemistry of Global Climate Change	3

Technical Electives

CEE 561 Physical-Chemical Treatment of Water and Waste	3
CEE 563 Environmental Chemistry Laboratory	3
CHE 474 Chemical Engineering Design for the Environment.....	3
CHE 478 Industrial Water Quality Engineering	3
CHE 479 Air Quality Control.....	3

Materials. Students interested in the development and production of new materials such as alloys, ceramics, composites, polymers, semiconductors, and superconductors should select from the following:

Chemistry Electives

CHM 345 Physical Chemistry I.....	3
CHM 346 Physical Chemistry II.....	3
CHM 453 Inorganic Chemistry.....	3
CHM 471 Solid-State Chemistry	3

Technical Electives

BME 318 Biomaterials	3
CHE 458 Semiconductor Material Processing	3
ECE 352 Properties of Electronic Materials	4
MSE 353 Introduction to Materials Processing and Synthesis	3
MSE 354 Experiments in Materials Synthesis and Processing I.....	2
MSE 431 Corrosion and Corrosion Control.....	3
MSE 470 Polymers and Composites.....	3

Premedical. Students planning to attend medical school should select courses from those listed under the biomedical area. In addition, BIO 181, 182, and CHM 336 must be taken to satisfy medical-school requirements but are not counted toward the Chemical Engineering bachelor's degree.

Process Engineering. The engineering core and required chemical engineering courses serve as a suitable background for students intending to enter the traditional petrochemical and chemical process industries. Students can build on this background by selecting courses with the approval of their advisor. Examples of these courses are as follows:

CHE 474 Chemical Engineering Design for the Environment	3
CHE 478 Industrial Water Quality Engineering	3
CHE 479 Air Quality Control	3
CHE 494 ST: Advanced Process Control.....	3
CHE 528 Process Optimization Techniques	3
CHE 556 Separation Processes	3
CHE 563 Chemical Engineering Design	3
MAE 436 Combustion	1-4

Semiconductor Processing. Students interested in the development and manufacturing of semiconductor and other electronic devices should select from the following:

Chemistry Electives

CHM 345 Physical Chemistry I.....	3
CHM 346 Physical Chemistry II.....	3
CHM 453 Inorganic Chemistry.....	3
CHM 471 Solid-State Chemistry	3

Technical Electives

CHE 458 Semiconductor Material Processing	3
CHE 494 Special Topics	1-4
ECE 352 Properties of Electronic Materials	4
EEE 435 Microelectronics	3
EEE 436 Fundamentals of Solid-State Devices	3
EEE 439 Semiconductor Facilities and Cleanroom Practices.....	3
MSE 353 Introduction to Materials Processing and Synthesis.....	3
MSE 354 Experiments in Materials Synthesis and Processing I...2	
MSE 472 Integrated Circuit Materials Science.....	3

**Chemical Engineering
Program of Study
Typical Four-Year Sequence**

First Year**First Semester**

CHM 113 General Chemistry <i>SQ</i>	4
ECE 100 Introduction to Engineering Design <i>CS</i>	4
ENG 101 First-Year Composition	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total	15

Second Semester

CHM 116 General Chemistry <i>SQ</i>	4
ENG 102 First-Year Composition	3
MAT 271 Calculus with Analytic Geometry II	4
PHY 121 University Physics I: Mechanics <i>SQ</i> *	3
PHY 122 University Physics Laboratory I <i>SQ</i> *	1
Total	15

Second Year**First Semester**

CHE 311 Introduction to Chemical Processing	3
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
ECE 394 ST: Conservation Principles.....	4
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	16

Second Semester

CHE 331 Transport Phenomena I: Fluids	3
CHM 331 General Organic Chemistry	3
CHM 335 General Organic Chemistry Laboratory.....	1
ECE 394 ST: Properties that Matter	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
HU/SB and awareness area course.....	3
Total	18

Third Year**First Semester**

CHE 332 Transport Phenomena II: Energy Transfer.....	3
CHE 342 Applied Chemical Thermodynamics	4
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 384 Numerical Methods for Engineers.....	4
HU/SB and awareness area course.....	3
Total	17

Second Semester

CHE 333 Transport Phenomena III: Mass Transfer.....	3
CHE 352 Transport Laboratories <i>L</i>	3
CHE 432 Principles of Chemical Engineering Design.....	3

CHM 332 General Organic Chemistry	3
ECE 394 ST: Engineering Systems	4
Total	16

Fourth Year**First Semester**

CHE 442 Chemical Reactor Design	3
CHE 451 Chemical Engineering Laboratory	2
CHE 461 Process Control <i>CS</i>	4
HU/SB and awareness area course.....	3
Technical elective.....	3
Total	15

Second Semester

CHE 462 Process Design	3
HU/SB and awareness area course.....	3
Technical elective.....	10
Total	16
Total degree requirements.....	128

* Both PHY 121 and 122 must be taken to secure *SQ* credit.

**MATERIALS SCIENCE AND ENGINEERING—
B.S.E.**

Innovations that create new and improved materials help drive the cutting edge of new technologies in many industries, including automotive, aerospace, materials production, semiconductors, electronics, and health professions. The space shuttle, lightweight cars, and today's fastest computers have all been developed using the latest materials technologies. Materials engineers play a critical role in innovations in such applications. In advancing today's technologies, they fulfill a wide range of job responsibilities. They may

1. select the best material for a given application or develop innovative materials and processing techniques for new applications;
2. analyze materials failures in order to redesign more robust engineering components; and
3. manage or participate with teams of engineers working on larger-scale engineering projects.

In summary, materials engineers play an important role in advancing leading-edge technologies in a wide range of industries.

The mission of the materials science and engineering program is to educate students in the application of basic principles of science toward the design and utilization of materials in engineering components for the betterment of humanity. The overall goal of the program is to produce high-quality graduates with a broad-based education in materials engineering who can effectively compete for the best positions in graduate school and or industry.

The mission of the Materials Science and Engineering program is achieved by having its graduates fulfill the following objectives. Graduates will

1. have a strong educational foundation in materials science and engineering that will promote success in a broad range of career opportunities available in graduate school, industry, and government;

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

2. have the personal skills and values that promote their success in the rapidly changing, culturally diverse workplace that reflects the needs of contemporary society.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is necessary for the B.S.E. degree in Materials Science and Engineering. A minimum of 50 upper-division semester hours is required. Students must attain a GPA of at least 2.00 for the courses in the major field.

Graduation Requirements. In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See "University Graduation Requirements," page 74.

Course Requirements. The undergraduate curriculum requires that students take a series of interdisciplinary courses of fundamental importance to an understanding of all engineering materials. Following these are additional courses that may be taken as technical electives to develop an area of study. The courses for the undergraduate degree can be classified into the following categories (in semester hours):

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
-----or-----	
ENG 105 Advanced First-Year Composition (3)	
Elective chosen with an advisor (3)	
-----or-----	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

Humanities and Fine Arts/Social and Behavioral Sciences

ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
HU, SB, and awareness area courses	12
Total	15

Literacy and Critical Inquiry

ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 400 Engineering Communications <i>L</i>	3
Total	6

Natural Sciences/Basic Sciences

CHM 113 General Chemistry <i>SQ</i>	4
CHM 116 General Chemistry <i>SQ</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory <i>SQ</i> ¹	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
Total	16

Mathematical Studies

ECE 100 Introduction to Engineering Design <i>CS</i>	4
MAT 242 Elementary Linear Algebra	2
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4

MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	21
General Studies/school requirements total	58

Engineering Core

ECE 201 Electrical Networks I	4
ECE 210 Engineering Mechanics I: Statics	3
ECE 313 Introduction to Deformable Solids	3
ECE 350 Structure and Properties of Materials	3
MSE 430 Thermodynamics of Materials	3
Total	16

Major

ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
MSE 353 Introduction to Materials Processing and Synthesis	3
MSE 354 Experiments in Materials Synthesis and Processing I	2
MSE 355 Introduction to Materials Science and Engineering	3
MSE 420 Physical Metallurgy	3
MSE 421 Physical Metallurgy Laboratory	1
MSE 440 Mechanical Properties of Solids	3
MSE 450 X-ray and Electron Diffraction	3
MSE 470 Polymers and Composites	3
MSE 471 Introduction to Ceramics	3
MSE 482 Materials Engineering Design	3
MSE 490 Capstone Design Project	3
Select two of the following four courses ³	6
CHM 325 Analytical Chemistry (3)	
CHM 331 General Organic Chemistry (3)	
CHM 341 Elementary Physical Chemistry (3)	
PHY 361 Introductory Modern Physics (3)	
Technical electives ⁴	9
Total	48

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

³ To take CHM 341 Elementary Physical Chemistry, CHM 331 Organic Chemistry must be taken as the prerequisite.

⁴ Three of the nine hours must be a non-MSE upper-division engineering elective course.

Materials Science and Engineering Areas of Study

Technical electives may be selected from one or more of the following areas. A student may, with prior approval of the department, select a general area or a set of courses that would support a career objective not covered by the following categories.

Biomaterials. Students interested in the materials used in the body and other living systems to improve or replace body components should choose from the following technical electives:

BME 318 Biomaterials	3
BME 411 Biomedical Engineering I	3
BME 412 Biomedical Engineering II	3
BME 413 Biomedical Instrumentation <i>L</i>	3
BME 416 Biomechanics	3

Ceramic Materials. Students who want to develop an understanding of the chemistry and processing that control the structure and properties of ceramics and their application should select from these technical electives:

CHM 331 General Organic Chemistry	3
CHM 332 General Organic Chemistry	3
CHM 471 Solid-State Chemistry	3
EEE 435 Microelectronics	3

EEE 436	Fundamentals of Solid-State Devices	3
EEE 439	Semiconductor Facilities and Cleanroom Practices.....	3
MSE 472	Integrated Circuit Materials Science.....	3

Energy Systems. Students interested in the materials used in energy conversion systems such as solar energy or nuclear energy should choose from the following technical electives:

MAE 441	Principles of Design.....	3
MAE 442	Mechanical Systems Design.....	3
MSE 431	Corrosion and Corrosion Control.....	3
MSE 441	Analysis of Material Failures.....	3

Integrated Circuit Materials. Students interested in the materials used in the semiconductor industry and in how they are processed to achieve the desired properties should choose from the following technical electives:

CHE 458	Semiconductor Material Processing	3
EEE 435	Microelectronics	3
EEE 436	Fundamentals of Solid-State Devices	3
EEE 439	Semiconductor Facilities and Cleanroom Practices.....	3
MSE 471	Introduction to Ceramics.....	3

Manufacturing and Materials Processing. Students interested in the manufacturing and processing of materials for a broad base of applications should choose from the following technical electives:

CHE 458	Semiconductor Material Processing	3
MAE 422	Mechanics of Materials.....	4
MAE 441	Principles of Design.....	3
MAE 442	Mechanical Systems Design	3
MSE 431	Corrosion and Corrosion Control.....	3
MSE 441	Analysis of Material Failures.....	3
MSE 472	Integrated Circuit Materials Science.....	3

Mechanical Metallurgy. Students interested in understanding the design, processing, and manufacturing of metals for structural applications, such as autos, airplanes, and buildings, should choose from the following technical electives:

MAE 415	Vibration Analysis.....	4
MAE 422	Mechanics of Materials.....	4
MAE 441	Principles of Design.....	3
MAE 442	Mechanical Systems Design	3
MSE 431	Corrosion and Corrosion Control.....	3
MSE 441	Analysis of Materials Failures	3

Metallic Materials Systems. Students interested in building an understanding of the basis for the design and processing of metals and alloys should choose from the following technical electives:

MAE 351	Manufacturing Processes	3
MSE 431	Corrosion and Corrosion Control.....	3
MSE 441	Analysis of Material Failures.....	3
MSE 472	Integrated Circuit Materials Science.....	3

Polymers and Composites. Students who desire to build an understanding of the chemical and processing basis for the properties of polymers and their applications, including composite systems, should select from the following technical electives:

CHM 331	General Organic Chemistry	3
CHM 332	General Organic Chemistry	3

CHM 471	Solid-State Chemistry	3
MSE 441	Analysis of Material Failures.....	3
MSE 472	Integrated Circuit Materials Science.....	3

Materials Science and Engineering Program of Study Typical Four-Year Sequence

First Year

First Semester		
CHM 113	General Chemistry <i>SQ</i>	4
ECE 100	Introduction to Engineering Design <i>CS</i>	4
ENG 101	First-Year Composition.....	3
MAT 270	Calculus with Analytic Geometry I <i>MA</i>	4
Total		15

Second Semester		
CHM 116	General Chemistry <i>SQ</i>	4
ENG 102	First-Year Composition.....	3
MAT 271	Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121	University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122	University Physics Laboratory I <i>SQ</i> ¹	1
Total		15

Second Year

First Semester		
ECE 210	Engineering Mechanics I: Statics.....	3
ECN 111	Macroeconomic Principles <i>SB</i>	3
MAT 242	Elementary Linear Algebra	2
MAT 272	Calculus with Analytic Geometry III <i>MA</i>	4
PHY 131	University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132	University Physics Laboratory II <i>SQ</i> ²	1
Total		16

Second Semester		
ECE 201	Electrical Networks I	4
ECE 313	Introduction to Deformable Solids.....	3
ECE 350	Structure and Properties of Materials	3
ECE 380	Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
MAT 274	Elementary Differential Equations <i>MA</i>	3
Total		16

Third Year

First Semester		
ECE 300	Intermediate Engineering Design <i>L</i>	3
MSE 353	Introduction to Materials Processing and Synthesis.....	3
MSE 355	Introduction to Materials Science and Engineering.....	3
Advanced science course ³		3
HU/SB and awareness area course ⁴		3
Total		15

Second Semester		
MSE 354	Experiments in Materials Synthesis and Processing I ...	2
MSE 420	Physical Metallurgy	3
MSE 421	Physical Metallurgy Laboratory	1
MSE 430	Thermodynamics of Materials	3
MSE 450	X-ray and Electron Diffraction	3
HU/SB and awareness area courses ⁴		6
Total		18

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Fourth Year

First Semester

MSE 440 Mechanical Properties of Solids	3
MSE 470 Polymers and Composites.....	3
MSE 471 Introduction to Ceramics.....	3
MSE 482 Materials Engineering Design.....	3
Technical electives	6
Total	18

Second Semester

ECE 400 Engineering Communications <i>L</i>	3
MSE 490 Capstone Design Project	3
Advanced science course ³	3
HU/SB and awareness area course ⁴	3
Technical elective.....	3
Total	15
Total degree requirements	128

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

³ To take CHM 341 Elementary Physical Chemistry, CHM 331 Organic Chemistry must be taken as the prerequisite.

⁴ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU and SB requirements.

GRADUATE STUDY

The faculty in the Department of Chemical and Materials Engineering also offer graduate programs leading to the M.S., M.S.E., and Ph.D. degrees. These programs provide a blend of classroom instruction and research. Many various topical and relevant research projects are available for thesis topics. Students interested in these programs should contact the department for up-to-date descriptive literature.

CHEMICAL ENGINEERING (CHE)

CHE 311 Introduction to Chemical Processing. (3)

fall and spring

Application of chemical engineering analysis and problem solving to chemical processes material and energy balance methods and skills. Prerequisites: CHM 116; MAT 271.

CHE 331 Transport Phenomena I: Fluids. (3)

fall and spring

Transport phenomena, with emphasis on fluid systems. Prerequisites: CHE 311; ECE 394 ST: Conservation Principles; MAT 274.

CHE 332 Transport Phenomena II: Energy Transfer. (3)

fall and spring

Continuation of transport principles, with emphasis on energy transport in stationary and fluid systems. Prerequisite: CHE 331.

CHE 333 Transport Phenomena III: Mass Transfer. (3)

fall and spring

Application of transport phenomena to mass transfer. Design of mass transfer equipment, including staged processes. Prerequisite: CHE 332.

CHE 342 Applied Chemical Thermodynamics. (4)

fall and spring

Application of conservation and accounting principles with nonideal property estimation techniques to model phase and chemical equilibrium processes. Lecture, recitation. Prerequisites: CHE 311; ECE 394 ST: Conservation Principles, ECE 394 ST: Properties that Matter. Pre- or corequisite: MAT 272.

CHE 352 Transport Laboratories. (3)

spring

Demonstration of transport phenomena principles with experiments in fluid flow, heat, and mass transfer. Prerequisites: CHE 332; ECE 300. Pre- or corequisite: CHE 333.

General Studies: L

CHE 432 Principles of Chemical Engineering Design. (3)

fall

Multicomponent distillation, engineering economics, equipment sizing and costs, plant operation economics, and simulation and optimization techniques. Prerequisites: CHE 332, 342.

CHE 442 Chemical Reactor Design. (3)

fall and spring

Application of kinetics to chemical reactor design. Prerequisite: CHE 342. Pre- or corequisite: CHE 333.

CHE 451 Chemical Engineering Laboratory. (2)

fall

Operation, control, and design of experimental and industrial process equipment; independent research projects. 6 hours lab. Prerequisites: CHE 333, 352; ECE 384.

CHE 458 Semiconductor Material Processing. (3)

not regularly offered

Introduction to the processing and characterization of electronic materials for semiconductor applications. Prerequisites: CHE 333, 342.

CHE 461 Process Control. (4)

fall

Process dynamics, instrumentation, and feedback applied to automatic process control. Lecture, lab. Prerequisite: ECE 394 ST: Engineering Systems.

General Studies: CS

CHE 462 Process Design. (3)

spring

Application of economic principles to optimize equipment selection and design; development and design of process systems. Prerequisites: CHE 432, 442.

CHE 474 Chemical Engineering Design for the Environment. (3)

fall

Conflict of processing materials and preserving the natural resources. Students understand and value the environment and attempt to control our impact. Prerequisites: CHE 333, 342.

CHE 475 Biochemical Engineering. (3)

not regularly offered

Application of chemical engineering methods, mass transfer, thermodynamics, and transport phenomena to industrial biotechnology. Prerequisite: instructor approval.

CHE 476 Bioreaction Engineering. (3)

not regularly offered

Principles of analysis and design of reactors for processing with cells and other biologically active materials; applications of reaction engineering in biotechnology. Prerequisite: instructor approval.

CHE 477 Bioseparation Processes. (3)

not regularly offered

Principles of separation of biologically active chemicals; the application, scale-up, and design of separation processes in biotechnology. Prerequisite: instructor approval.

CHE 478 Industrial Water Quality Engineering. (3)

fall

Chemical treatment processing, quality criteria and control, system design, and water pollutants. Prerequisites: CHE 331; senior standing.

CHE 479 Air Quality Control. (3)

fall

Air pollutant control, effects, and origins. Chemical and physical processes, including combustion, control equipment design, dispersion, and sampling. Prerequisites: CHE 331; senior standing.

CHE 490 Chemical Engineering Projects. (1–5)

fall, spring, summer

Individual projects in chemical engineering operations and design. Prerequisite: instructor approval.

CHE 494 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Advanced Process Control. (3)
- (b) Biotechnology Techniques. (3)

CHE 496 Professional Seminar. (1–3)

fall and spring

Professional and ethical aspects with a discussion of responsibilities. Lecture, field trips. Prerequisite: instructor approval.

CHE 501 Introduction to Transport Phenomena. (3)

fall and spring

Transport phenomena, with emphasis on fluid systems. Prerequisite: transition student with instructor approval.

CHE 502 Introduction to Energy Transport. (3)*fall and spring*

Continuation of transport principles, with emphasis on energy transport in stationary and fluid systems. Prerequisite: transition student with instructor approval.

CHE 503 Introduction to Mass Transport. (3)*fall and spring*

Application of transport phenomena to mass transfer. Design of mass transfer equipment, including staged processes. Prerequisite: transition student with instructor approval.

CHE 504 Introduction to Chemical Thermodynamics. (3)*fall and spring*

Energy relations and equilibrium conversions based on chemical potentials and phase equilibria. Prerequisite: transition student with instructor approval.

CHE 505 Introduction to Chemical Reactor Design. (3)*fall and spring*

Application of kinetics to chemical reactor design. Prerequisite: transition student with instructor approval.

CHE 527 Advanced Applied Mathematical Analysis in Chemical Engineering. (3)*fall*

Formulation and solution of complex mathematical relationships resulting from the description of physical problems in mass, energy, and momentum transfer and chemical kinetics.

CHE 528 Process Optimization Techniques. (3)*spring*

Method for optimizing engineering processes. Experimental design and analysis; linear and nonlinear regression methods; classical, search, and dynamic programming algorithms.

CHE 533 Transport Processes I. (3)*fall*

Unified treatment of momentum, heat, and mass transfer from molecular theory, and continuum points of view. Continuum equations of microscopic and macroscopic systems and multicomponent and multiphase systems. Cross-listed as BME 533. Credit is allowed for only BME 533 or CHE 533.

CHE 534 Transport Processes II. (3)*spring*

Continuation of BME 533 or CHE 533, emphasizing mass transfer. Cross-listed as BME 534. Credit is allowed for only BME 534 or CHE 534. Prerequisite: BME 533 or CHE 533.

CHE 536 Convective Mass Transfer. (3)*not regularly offered*

Turbulent flow for multicomponent systems, including chemical reactions with applications in separations and air pollution. Prerequisite: CHE 533 or MAE 571.

CHE 543 Thermodynamics of Chemical Systems. (3)*fall*

Classical and statistical thermodynamics of nonideal physicochemical systems and processes; prediction of optimum operating conditions. Cross-listed as BME 543. Credit is allowed for only BME 543 or CHE 543.

CHE 544 Chemical Reactor Engineering. (3)*spring*

Reaction rates, thermodynamics, and transport principles applied to the design and operation of chemical reactors. Cross-listed as BME 544. Credit is allowed for only BME 544 or CHE 544. Prerequisite: BME 543 or CHE 543.

CHE 548 Topics in Catalysis. (3)*not regularly offered*

Engineering catalysis, emphasizing adsorption, kinetics, characterization, diffusional considerations, and reactor design. Other topics include mechanisms, surface analyses, and electronic structure.

CHE 552 Industrial Water Quality Engineering. (3)*not regularly offered*

Water pollutants, quality criteria and control, chemical treatment processing, and system design. Case studies. Prerequisite: CHE 331 (or its equivalent).

CHE 553 Air Quality Control. (3)*not regularly offered*

Air pollutant origins, effects, and control. Physical and chemical processes, including dispersion, combustion, sampling, control equipment design, and special topics. Prerequisite: CHE 331 (or its equivalent).

CHE 554 New Energy Technology. (3)*not regularly offered*

Gasification, liquefaction pyrolysis, and combustion processes for coal, wastes, and other raw materials. In-situ processes for coal, oil, shale, and geothermal energy. Environmental quality issues.

CHE 556 Separation Processes. (3)*not regularly offered*

Topics in binary/multicomponent separation, rate governed and equilibrium processes, mass transfer criteria, energy requirements, separating agents and devices, and staged operations.

CHE 558 Electronic Materials. (3)*not regularly offered*

Processing and characterization of electronic materials for semiconductor-type uses. Thermodynamics and transport phenomena, phase equilibria and structure, mass transfer, and diffusion and thermal properties.

CHE 561 Advanced Process Control. (3)*spring*

Dynamic process representation, linear optimal control, optimal state reconstruction, and parameter and state estimation techniques for continuous and discrete time systems.

CHE 563 Chemical Engineering Design. (3)*not regularly offered*

Computational methods; the design of chemical plants and processes.

MATERIALS SCIENCE AND ENGINEERING (MSE)**MSE 353 Introduction to Materials Processing and Synthesis. (3)***fall*

Principles of materials structure and properties with emphasis on applications in bulk and thin film materials processing and synthesis. Prerequisites: CHM 116 and PHY 131 (or their equivalents).

MSE 354 Experiments in Materials Synthesis and Processing. (2)*spring*

Small groups of students complete three experiments selected from a list. Each is supervised by a selected faculty member. Lab. Prerequisite: MSE 353 (or its equivalent).

MSE 355 Introduction to Materials Science and Engineering. (3)*fall*

Elements of the structure of metals and alloys, measurement of mechanical properties, and optical metallography. Lecture, lab, field trips. Prerequisite: CHM 114 or 116.

MSE 420 Physical Metallurgy. (3)*spring*

Crystal structure and defects. Phase diagrams, metallography, solidification and casting, deformation, and annealing. Prerequisite: ECE 350.

MSE 421 Physical Metallurgy Laboratory. (1)*spring*

Focuses on analysis of microstructure of metals and alloys and includes correlation with mechanical properties to some extent. Lab. Pre- or corequisite: MSE 420.

MSE 430 Thermodynamics of Materials. (3)*spring*

Principles of statistical mechanics, statistical thermodynamics of single crystals, solutions, phase equilibrium, free energy of reactions, free electron theory, and thermodynamics of defects. Prerequisite: ECE 350.

MSE 431 Corrosion and Corrosion Control. (3)*spring*

Introduction to corrosion mechanisms and methods of preventing corrosion. Topics include the following: electrochemistry, polarization, corrosion rates, oxidation, coatings, and cathodic protection. Prerequisite: ECE 350.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MSE 440 Mechanical Properties of Solids. (3)*fall*

Effects of environmental and microstructural variables of mechanical properties, including plastic deformation, fatigue, creep, brittle fracture, and internal friction. Prerequisite: ECE 350.

MSE 441 Analysis of Material Failures. (3)*spring*

Identification of types of failures. Analytical techniques. Fractography, SEM, nondestructive inspection, and metallography. Mechanical and electronic components. Prerequisite: ECE 350.

MSE 450 X-ray and Electron Diffraction. (3)*spring*

Fundamentals of X-ray diffraction, transmission electron microscopy, and scanning electron microscopy. Techniques for studying surfaces, internal microstructures, and fluorescence. Lecture, demonstrations. Prerequisite: ECE 350.

MSE 470 Polymers and Composites. (3)*fall*

Relationship between chemistry, structure, and properties of engineering polymers. Design, properties, and behavior of fiber composite systems. Cross-listed as MAE 455. Credit is allowed for only MAE 455 or MSE 470. Prerequisite: ECE 350.

MSE 471 Introduction to Ceramics. (3)*fall*

Principles of structure and property relations in ceramic materials. Processing techniques. Applications in mechanical, electronic, and superconducting systems. Prerequisite: ECE 350.

MSE 472 Integrated Circuit Materials Science. (3)*not regularly offered*

Principles of materials science applied to semiconductor processing and fabrication in metals, ceramics, polymers, and semiconductors. Prerequisite: ECE 350.

MSE 482 Materials Engineering Design. (3)*spring*

Principles of the design process. Feasibility and optimization. Manufacturing processes, materials selection, failure analysis, and economics. Prerequisites: ECE 313, 350.

MSE 490 Capstone Design Project. (1–3)*fall and spring*

For small groups in fundamental or applied aspects of engineering materials; emphasis on experimental problems and design. Prerequisites: MSE 430, 440, 450.

MSE 510 X-ray and Electron Diffraction. (3)*spring*

Fundamentals of X-ray diffraction, transmission electron microscopy, and scanning electron microscopy. Techniques for studying surfaces, internal microstructures, and fluorescence. Lecture, demonstrations. Prerequisite: transition student with instructor approval.

MSE 511 Corrosion and Corrosion Control. (3)*not regularly offered*

Introduction to corrosion mechanisms and methods of preventing corrosion. Topics include: electrochemistry, polarization, corrosion rates, oxidation, coatings, and cathodic protection. Prerequisite: transition student with instructor approval.

MSE 512 Analysis of Material Failures. (3)*not regularly offered*

Identification of types of failures. Analytical techniques. Fractography, SEM, nondestructive inspection, and metallography. Mechanical and electronic components. Prerequisite: transition student with instructor approval.

MSE 513 Polymers and Composites. (3)*fall*

Relationship between chemistry, structure, and properties of engineering polymers. Design, properties, and behavior of fiber composite systems.

MSE 514 Physical Metallurgy. (3)*spring*

Crystal structure and defects. Phase diagrams, metallography, solidification and casting, and deformation and annealing. Prerequisite: transition student with instructor approval.

MSE 515 Thermodynamics of Materials. (3)*not regularly offered*

Principles of statistical mechanics, statistical thermodynamics of single crystals, solutions, phase equilibrium, free energy of reactions, free electron theory, and thermodynamics of defects. Prerequisite: transition student with instructor approval.

MSE 516 Mechanical Properties of Solids. (3)*fall*

Effects of environmental and microstructural variables of mechanical properties, including plastic deformation, fatigue, creep, brittle fracture, and internal friction. Prerequisite: transition student with instructor approval.

MSE 517 Introduction to Ceramics. (3)*fall*

Principles of structure, property relations in ceramic materials. Processing techniques. Applications in mechanical, electronic, and superconducting systems. Prerequisite: transition student with instructor approval.

MSE 518 Integrated Circuits Materials Science. (3)*not regularly offered*

Principles of materials science applied to semiconductor processing and fabrication in metals, ceramics, polymers, and semiconductors. Prerequisite: transition student with instructor approval.

MSE 519 Physical Metallurgy Laboratory. (1)*spring*

Analyzes microstructure of metals and alloys and includes some correlation with mechanical properties. Lab. Pre- or corequisite: MSE 514.

MSE 520 Theory of Crystalline Solids. (3)*not regularly offered*

Anisotropic properties of crystals; tensor treatment of elastic, magnetic, electric and thermal properties, and crystallography of Martensitic transformations.

MSE 521 Defects in Crystalline Solids. (3)*not regularly offered*

Introduction to the geometry, interaction, and equilibrium between dislocations and point defects. Discusses relations between defects and properties. Prerequisite: ECE 350 or instructor approval.

MSE 530 Materials Thermodynamics and Kinetics. (3)*not regularly offered*

Thermodynamics of alloy systems, diffusion in solids, kinetics of precipitation, and phase transformations in solids. Prerequisites: ECE 340, 350.

MSE 540 Fracture, Fatigue, and Creep. (3)*not regularly offered*

Relationship between microstructure and fracture; fatigue and creep properties of materials. Environmental effects and recent developments. Current theories and experimental results. Prerequisite: MSE 440 (or its equivalent).

MSE 550 Advanced Materials Characterization. (3)*not regularly offered*

Analytical instrumentation for characterization of materials; SEM, SIMS, Auger, analytical TEM, and other advanced research techniques.

MSE 556 Electron Microscopy Laboratory. (3)*fall*

Lab support for MSE 558. Cross-listed as SEM 556. Credit is allowed for only MSE 556 or SEM 556. Pre- or corequisite: MSE 558 or SEM 558.

MSE 557 Electron Microscopy Laboratory. (3)*spring*

Lab support for MSE 559. Cross-listed as SEM 557. Credit is allowed for only MSE 557 or SEM 557. Pre- or corequisite: MSE 559 or SEM 559.

MSE 558 Electron Microscopy I. (3)*fall*

Microanalysis of the structure and composition of materials using images, diffraction, X-ray, and energy spectroscopy. Requires knowledge of elementary crystallography, reciprocal lattice, stereographic projections, and complex variables. Cross-listed as SEM 558. Credit is allowed for only MSE 558 or SEM 558. Prerequisite: instructor approval.

MSE 559 Electron Microscopy II. (3)*spring*

Microanalysis of the structure and composition of materials using images, diffraction, X-ray, and energy loss spectroscopy. Requires knowledge of elementary crystallography, reciprocal lattice, stereographic projections, and complex variables. Cross-listed as SEM 559. Credit is allowed for only MSE 559 or SEM 559. Prerequisite: instructor approval.

MSE 560 Strengthening Mechanisms. (3)*not regularly offered*

Deformation of crystalline materials. Properties of dislocations. Theories of strain hardening, solid solution, precipitation, and transformation strengthening. Prerequisite: ECE 350 (or its equivalent).

MSE 561 Phase Transformation in Solids. (3)*not regularly offered*

Heterogeneous and homogeneous precipitation reactions, shear displacive reactions, and order-disorder transformation.

MSE 562 Ion Implantation. (3)*not regularly offered*

Includes defect production and annealing. Generalized treatment, including ion implantation, neutron irradiation damage, and the interaction of other incident beams. Prerequisite: MSE 450.

MSE 570 Polymer Structure and Properties. (3)*not regularly offered*

Relationships between structure and properties of synthetic polymers, including glass transition, molecular relaxations, crystalline state viscoelasticity, morphological characterization, and processing.

MSE 571 Ceramics. (3)*not regularly offered*

Includes ceramic processing, casting, molding, firing, sintering, crystal defects, and mechanical, electronic, and physical properties. Prerequisites: MSE 521, 561.

MSE 573 Magnetic Materials. (3)*not regularly offered*

Emphasizes ferromagnetic and ferrimagnetic phenomena. Domains, magnetic anisotropy, and magnetostriction. Study of commercial magnetic materials. Prerequisite: MSE 520 (or its equivalent).

MSE 598 Special Topics. (1-4)*not regularly offered*

Possible topics:

- (a) Growth and Processing of Semiconductor Devices. (3)

impact of their projects on the public and the environment, and they attempt to coordinate the needs of society with technical and economic feasibility.

Career Opportunities in the Field. University graduates with the B.S.E. degree in Civil Engineering readily find employment. Civil engineers work in many different types of companies, from large corporations to small, private consulting firms, or in governmental agencies. A civil engineering background is an excellent foundation for jobs in management and public service. Civil engineering is one of the best engineering professions from the viewpoint of international travel opportunities or for eventually establishing one's own consulting business.

Uniqueness of the Program at ASU. The faculty in the Department of Civil and Environmental Engineering at ASU offer a challenging program of study designed to provide the student with the resources and background to pursue a career in a wide range of specialty areas. Some of these areas are structural, geotechnical, environmental and water resources, transportation and materials engineering. The Civil Engineering program is fully accredited by ABET. With the program, students will be prepared for the Fundamentals of Engineering examination and professional registration.

The Department of Civil and Environmental Engineering offers challenging programs of study designed to provide students with the scientific and technical resources to pursue a broad and multifaceted range of careers.

Civil Engineering Areas of Study

Areas of study in the civil engineering curriculum are described below.

Environmental Engineering. This area of study includes the quality of air, water, and land resources; transport, use, and disposal of hazardous wastes; water and wastewater treatment; and water reuse.

Geotechnical/Geoenvironmental Engineering. This area of study includes the analysis and design of foundation systems, seepage control, earthdams and water resource structures, earthwork operations, fluid flow-through porous media, response of foundations and embankments to earthquakes, and solutions to environmental problems.

Structures/Materials Engineering. This area of study considers the planning, analysis and design of steel and concrete bridges, buildings, dams; special offshore and space structures; Portland cement concrete; composite materials; and structural retrofit of existing bridges.

Transportation/Materials Engineering. This area of study includes (1) transportation planning, design, and operation and (2) pavements and materials. Transportation planning, design, and operation covers urban transport planning, geometric design of facilities, traffic operations, evaluation of highway capacity and safety, and intelligent vehicle/highway systems. Pavements and materials focus on pavement analysis and design; pavement maintenance and rehabilitation; pavement evaluation and management;

Department of Civil and Environmental Engineering

Sandra L. Houston

Chair

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PROFESSORS

S. HOUSTON, W. HOUSTON, MAMLOUK, MAYS,
RAJAN, SINGHAL, WITCZAK

ASSOCIATE PROFESSORS

ABBASZADEGAN, FAFITIS, FOX, HINKS,
JOHNSON, MOBASHER

ASSISTANT PROFESSORS

ALLEN, DILLNER, MUCCINO, OWUSU-ANTWI,
WESTERHOFF, ZHU

The civil engineering profession includes analysis, planning, design, construction, and maintenance of many types of facilities for government, commerce, industry, and the public domain. These facilities include high-rise office towers, factories, schools, airports, tunnels and subway systems, dams, canals, and water purification and environmental protection facilities such as solid waste and wastewater treatment systems. Civil engineers are concerned with the

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

characterization of highway materials; and durability of highway structures.

Water Resources Engineering. This area of study is concerned with surface and groundwater flow, planning and management of water supply, and water distribution system modeling.

The undergraduate program provides an excellent background for entry to graduate study in engineering.

UNDERGRADUATE OPPORTUNITIES IN CIVIL AND ENVIRONMENTAL ENGINEERING

Students majoring in Civil Engineering have three choices:

1. the major without a concentration;
2. the major with a concentration in construction engineering; and
3. the major with a concentration in environmental engineering.

Civil Engineering. The B.S.E. degree in Civil Engineering offers students a wide background on various areas of study within civil and environmental engineering. The degree provides basic principles of environmental, geotechnical/geoenvironmental, structural/materials, transportation/materials, and water resources engineering. Students have the option to select among a certain number of design and technical elective courses in their junior and senior years.

Civil Engineering with Construction Engineering Concentration. The B.S.E. degree in Civil Engineering with a construction engineering concentration offers students basic principles of civil engineering with the option to concentrate on construction engineering. The degree provides education based on the traditional engineering principles, construction materials and practice, quality control, and civil engineering project management.

Civil Engineering with Environmental Engineering Concentration. The B.S.E. degree in Civil Engineering with an environmental engineering concentration offers students basic principles of civil engineering with the option to concentrate on environmental engineering. The degree provides a multidisciplinary education based on the traditional engineering principles, chemistry, biology, and hydrogeology.

CIVIL ENGINEERING—B.S.E.

The B.S.E. degree in Civil Engineering requires a minimum of 128 semester hours of course work. A minimum of 50 upper-division semester hours is required. The minimum requirements are for a student who has successfully completed at least a year (each) of high school chemistry, physics, and computer programming along with precalculus, algebra, and trigonometry.

The B.S.E. degree program consists of the following categories:

Civil Engineering	
First-Year Composition.....	6
General Studies/school requirements.....	55
Engineering core	19–20
Major.....	47–48
Minimum total	128

Civil Engineering with Construction Engineering Concentration

First-Year Composition.....	6
General Studies/school requirements.....	55
Engineering core	20
Major.....	47
Total	128

Civil Engineering with Environmental Engineering Concentration

First-Year Composition.....	6
General Studies/school requirements.....	55
Engineering core	19
Major.....	48
Total	128

Graduation Requirements

In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See “University Graduation Requirements,” page 74.

Course Requirements. For more information concerning School of Engineering requirements for admission, degree, course, and graduation requirements, see “School of Engineering,” page 211 of this catalog.

DEGREE REQUIREMENTS WITHOUT CONCENTRATION

Civil Engineering Core

Twenty-six semester hours are required. All chemistry (CHM), mathematics (MAT), physics (PHY), and engineering core (ECE) courses, except ECE 380 and 384, must be completed with an average grade of “C” or higher. CEE courses, except CEE 296, may not be taken in any semester until the above mentioned courses are completed or are being completed in that semester. No 400-level courses may be taken until ECE 380 and 384 have been completed. Each sequence of the CEE courses and the senior design and technical elective courses must be completed with an average grade of “C” or higher.

CEE 296 Civil Engineering Systems.....	3
CEE 321 Structural Analysis and Design.....	4
CEE 341 Fluid Mechanics for Civil Engineers	4
CEE 351 Geotechnical Engineering.....	4
CEE 361 Introduction to Environmental Engineering	4
CEE 372 Transportation Engineering.....	4
ECE 380 Probability and Statistics for Engineering Problem Solving CS	3
Total	26

Civil Engineering Design Electives

Six semester hours from the following list are required.

CEE 423 Structural Design	3
CEE 441 Water Resources Engineering	3
CEE 452 Foundations.....	3
CEE 466 Sanitary Systems Design.....	3
CEE 475 Highway Geometric Design.....	3

Civil Engineering Technical Electives

From 15 to 16 semester hours are required. The design elective courses that have not been selected to satisfy the design electives requirement (see above) may be used as technical electives.

A maximum of seven hours may be selected from outside civil engineering, with an advisor’s approval. Construction

courses taken as technical electives may be selected from the following list: CON 341, 383, 495, and 496. Students must select technical and design electives from at least three different CEE areas of study.

Environmental Engineering

CEE 362 Unit Operations in Environmental Engineering.....	3
CEE 466 Sanitary Systems Design.....	3
CEE 467 Environmental Microbiology.....	4
CHM 231 Elementary Organic Chemistry <i>SQ</i>	3

Geotechnical/Geoenvironmental Engineering

CEE 452 Foundations.....	3
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Structures/Materials Engineering

CEE 322 Steel Structures.....	3
CEE 323 Concrete Structures.....	3
CEE 423 Structural Design.....	3
CEE 432 Matrix and Computer Applications in Structural Engineering.....	3

Transportation/Materials Engineering

CEE 412 Pavement Analysis and Design.....	3
CEE 475 Highway Geometric Design.....	3
CEE 481 Civil Engineering Project Management.....	3
CEE 483 Highway Materials, Construction, and Quality.....	3

Water Resources Engineering

CEE 440 Engineering Hydrology.....	3
CEE 441 Water Resources Engineering.....	3

**Civil Engineering Program of Study
A Four-Year Sequence**

First Year

First Semester

CHM 114 General Chemistry for Engineers <i>SQ</i>	4
ECE 100 Introduction to Engineering Design <i>CS</i>	4
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total.....	15

Second Semester

CEE 296 Civil Engineering Systems.....	3
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
ENG 102 First-Year Composition.....	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
Total.....	17

Second Year

First Semester

ECE 210 Engineering Mechanics I: Statics.....	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
HU/SB and awareness area course ³	3
Total.....	17

Second Semester

ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 313 Introduction to Deformable Solids.....	3

ECE 340 Thermodynamics.....	3
or ECE 201 Electrical Networks I (4)	
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
Basic science elective.....	3
Total.....	15-16

Third Year

First Semester

CEE 321 Structural Analysis and Design.....	4
CEE 341 Fluid Mechanics for Civil Engineers.....	4
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 351 Civil Engineering Materials.....	3
ECE 384 Numerical Methods for Engineers.....	4
Total.....	18

Second Semester

CEE 351 Geotechnical Engineering.....	4
CEE 361 Introduction to Environmental Engineering.....	4
CEE 372 Transportation Engineering.....	4
HU/SB and awareness area course ³	3
Total.....	15

Fourth Year

First Semester

Design elective.....	3
HU/SB and awareness area course ³	3
Technical electives.....	9
Total.....	15

Second Semester

CEE 486 Integrated Civil Engineering Design <i>L</i>	3
Design elective.....	3
HU/SB and awareness area course ³	3
Technical electives.....	6-7
Total.....	15-16
Minimum total.....	128

- ¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.
- ² Both PHY 131 and 132 must be taken to secure *SQ* credit.
- ³ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU or SB requirements.

A maximum of two graduate courses may be taken for undergraduate credit by students whose cumulative GPA is 3.00 or higher with the approval of the instructor, advisor, department chair, and the dean of the college.

DEGREE REQUIREMENTS WITH CONSTRUCTION ENGINEERING CONCENTRATION

Construction Engineering Core

Twenty-six semester hours are required. All chemistry (CHM), mathematics (MAT), physics (PHY), and engineering core (ECE) courses, except ECE 380 and 384, must be completed with an average grade of "C" or higher. CEE courses, except CEE 296, may not be taken in any semester until the above mentioned courses are completed or are being completed in that semester. No 400-level courses may be taken until ECE 380 and 384 have been completed. Each sequence of the CEE courses and the senior design and

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

technical elective courses must be completed with an average grade of “C” or higher.

CEE 296 Civil Engineering Systems.....	3
CEE 321 Structural Analysis and Design.....	4
CEE 341 Fluid Mechanics for Civil Engineers.....	4
CEE 351 Geotechnical Engineering.....	4
CEE 361 Introduction to Environmental Engineering.....	4
CEE 372 Transportation Engineering.....	4
ECE 380 Probability and Statistics for Engineering Problem Solving CS.....	3
Total	26

Construction Engineering Design Courses

CEE 322 Steel Structures.....	3
CEE 452 Foundations.....	3
Total	6

Construction Engineering Technical Courses

CEE 323 Concrete Structures.....	3
CEE 481 Civil Engineering Project Management.....	3
CEE 483 Highway Materials, Construction, and Quality.....	3
CON 341 Surveying.....	3
CON 496 Construction Contract Administration <i>L</i>	3
Total	15

Construction Engineering Concentration Program of Study A Four-Year Sequence

First Year

First Semester

CHM 114 General Chemistry for Engineers <i>SQ</i>	4
or CHM 116 General Chemistry <i>SQ</i> (4)	
ECE 100 Introduction to Engineering Design CS.....	4
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total	15

Second Semester

CEE 296 Civil Engineering Systems.....	3
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Macroeconomic Principles <i>SB</i> (3)	
ENG 102 First-Year Composition.....	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
Total	17

Second Year

First Semester

ECE 210 Engineering Mechanics I: Statics.....	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
HU/SB and awareness area course ³	3
Total	17

Second Semester

ECE 201 Electrical Networks I.....	4
ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 313 Introduction to Deformable Solids.....	3
ECE 380 Probability and Statistics for Engineering Problem Solving CS.....	3
Basic science elective.....	3
Total	16

Third Year

First Semester

CEE 321 Structural Analysis and Design.....	4
CEE 341 Fluid Mechanics for Civil Engineers.....	4
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 351 Civil Engineering Materials.....	3
ECE 384 Numerical Methods for Engineers.....	4
Total	18

Second Semester

CEE 351 Geotechnical Engineering.....	4
CEE 361 Introduction to Environmental Engineering.....	4
CEE 372 Transportation Engineering.....	4
HU/SB and awareness area course ³	3
Total	15

Fourth Year

First Semester

CEE 322 Steel Structures.....	3
CEE 452 Foundations.....	3
CEE 481 Civil Engineering Project Management.....	3
CON 341 Surveying.....	3
HU/SB and awareness area course ³	3
Total	15

Second Semester

CEE 323 Concrete Structures.....	3
CEE 483 Highway Materials, Construction, and Quality.....	3
CEE 486 Integrated Civil Engineering Design <i>L</i>	3
CON 496 Construction Contract Administration <i>L</i>	3
HU/SB and awareness area course ³	3
Total	15
Graduation requirement total.....	128

¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.

² Both PHY 131 and 132 must be taken to secure *SQ* credit.

³ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU or SB requirements. Students should consider the following list of electives to enhance communication and management skills: COM 100, 110, 320; PUP 100, 200.

A maximum of two graduate courses may be taken for undergraduate credit by students whose cumulative GPA is 3.00 or higher and with the approval of the instructor, advisor, department chair, and the dean of the college.

DEGREE REQUIREMENTS WITH ENVIRONMENTAL ENGINEERING CONCENTRATION

Environmental Engineering Core

Twenty-nine semester hours are required. All chemistry (CHM), mathematics (MAT), physics (PHY), and engineering core (ECE) courses, except ECE 380 and 384, must be completed with an average grade of “C” or higher. CEE courses, except CEE 296, may not be taken in any semester until the above mentioned courses are completed or are being completed in that semester. No 400-level courses may be taken until ECE 380 and 384 have been completed. Each sequence of the CEE courses and the senior design and technical elective courses must be completed with an average grade of “C” or higher.

CEE 296 Civil Engineering Systems.....	3
CEE 321 Structural Analysis and Design.....	4
CEE 341 Fluid Mechanics for Civil Engineers.....	4

CEE 351 Geotechnical Engineering	4
CEE 361 Introduction to Environmental Engineering	4
CEE 372 Transportation Engineering	4
CHM 341 Elementary Physical Chemistry	3
ECE 380 Probability and Statistics for Engineering Problem Solving CS	3
Total	29

Environmental Engineering Design Courses

CEE 441 Water Resources Engineering	3
CEE 466 Sanitary Systems Design	3
Total	6

Environmental Engineering Technical Courses

BIO 320 Fundamentals of Ecology	3
or BCH 361 Principles of Biochemistry (3)	
or CHM 302 Environmental Chemistry (3)	
or PUP 442 Environmental Planning (3)	
or PUP 475 Environmental Impact Assessment (3)	
CEE 362 Unit Operations in Environmental Engineering	3
CEE 440 Engineering Hydrology	3
CEE 467 Environmental Microbiology	4
Total	13

**Environmental Engineering Concentration
Program of Study
A Four-Year Sequence**

First Year

First Semester

CHM 114 General Chemistry for Engineers SQ	4
ECE 100 Introduction to Engineering Design CS	4
ENG 101 First-Year Composition	3
MAT 270 Calculus with Analytic Geometry I MA	4
Total	15

Second Semester

CEE 296 Civil Engineering Systems	3
ECN 111 Macroeconomic Principles SB	3
or ECN 112 Macroeconomic Principles SB (3)	
ENG 102 First-Year Composition	3
MAT 271 Calculus with Analytic Geometry II MA	4
PHY 121 University Physics I: Mechanics SQ ¹	3
PHY 122 University Physics Laboratory I SQ ¹	1
Total	17

Second Year

First Semester

ECE 210 Engineering Mechanics I: Statics	3
MAT 272 Calculus with Analytic Geometry III MA	4
MAT 274 Elementary Differential Equations MA	3
PHY 131 University Physics II: Electricity and Magnetism SQ ²	3
PHY 132 University Physics Laboratory II SQ ²	1
HU/SB and awareness area course ³	3
Total	17

Second Semester

CHM 231 Elementary Organic Chemistry SQ	3
ECE 212 Engineering Mechanics II: Dynamics	3
ECE 313 Introduction to Deformable Solids	3

ECE 340 Thermodynamics	3
ECE 380 Probability and Statistics for Engineering Problem Solving CS	3
Total	15

Third Year

First Semester

CEE 321 Structural Analysis and Design	4
CEE 341 Fluid Mechanics for Civil Engineers	4
ECE 300 Intermediate Engineering Design L	3
ECE 351 Civil Engineering Materials	3
ECE 384 Numerical Methods for Engineers	4
Total	18

Second Semester

CEE 351 Geotechnical Engineering	4
CEE 361 Introduction to Environmental Engineering	4
CEE 372 Transportation Engineering	4
BIO 320 Fundamentals of Ecology	3
or BCH 361 Principles of Biochemistry (3)	
or CHM 302 Environmental Chemistry (3)	
or CHM 341 Elementary Physical Chemistry (3)	
or PUP 442 Environmental Planning (3)	
or PUP 475 Environmental Impact Assessment (3)	
HU/SB and awareness area course ³	3
Total	18

Fourth Year

First Semester

CEE 362 Unit Operations in Environmental Engineering	3
CEE 440 Engineering Hydrology	3
CEE 466 Sanitary Systems Design	3
CEE 467 Environmental Microbiology	4
HU/SB and awareness area course ³	3
Total	16

Second Semester

CEE 441 Water Resources Engineering	3
CEE 486 Integrated Civil Engineering Design L	3
HU/SB and awareness area course ³	3
Technical elective	3
Total	12
Graduation requirement total	128

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

³ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU or SB requirements.

A maximum of two graduate courses may be taken for undergraduate credit by students whose cumulative GPA is 3.00 or higher with the approval of the instructor, advisor, department chair, and the dean of the college.

Concurrent Studies in Architecture and Civil Engineering

Undergraduate. Qualified lower-division students interested in combining studies in architecture and civil engineering may prepare for upper-division and graduate courses in both programs by taking courses shown for option B under the Architectural Studies major. See "Architectural Studies—B.S.D.," page 125.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CIVIL AND ENVIRONMENTAL ENGINEERING (CEE)

CEE Note 1. Students enrolled in CEE 580, 590, 592, 599, 792, and 799 are required to attend graduate student seminars at the times shown in the *Schedule of Classes*.

CEE Note 2. Each semester, every graduate student enrolled for more than eight semester hours is to enroll for at least one semester hour of CEE 592, 599, 792, or 799.

CEE 296 Civil Engineering Systems. (3)

fall and spring

Introduction to civil engineering. Problem solving, economics, description of civil engineering systems, design concepts, ethics, and professional responsibilities. Lecture, field trips. Pre- or corequisite: ECE 100.

CEE 321 Structural Analysis and Design. (4)

fall and spring

Statically determinate and indeterminate structures (trusses, beams, and frames) by classical and matrix methods. Introduction to structural design. Lecture, recitation. Prerequisites: ECE 312, 313. Pre- or corequisites: ECE 380, 384.

CEE 322 Steel Structures. (3)

fall

Behavior of structural components and systems. Design of steel members and connections. Load and resistance factor design methods. Lecture, recitation. Prerequisite: CEE 321.

CEE 323 Concrete Structures. (3)

spring

Behavior of concrete structures and the design of reinforced and prestressed concrete members, including footings. Partial design of concrete building system. Lecture, recitation. Prerequisite: CEE 321.

CEE 340 Hydraulics and Hydrology. (3)

fall and spring

Application of hydraulic engineering principles to flow of liquids in pipe systems and open channels; hydrostatics; characteristics of pumps and turbines. Introduction to hydrology. Not open to engineering students. Lecture, lab. Prerequisite: CON 221.

CEE 341 Fluid Mechanics for Civil Engineers. (4)

fall and spring

Fundamental principles and methods of fluid mechanics forming the analytical basis for water resources engineering. Conduit and open channel flow. 3 hours lecture, 1 hour lab. Prerequisites: ECE 312, 313. Pre- or corequisites: ECE 380, 384.

CEE 351 Geotechnical Engineering. (4)

fall and spring

Index properties and engineering characteristics of soils. Compaction, permeability and seepage, compressibility and settlement, and shear strength. Lecture, lab. Prerequisites: ECE 312, 313. Pre- or corequisites: ECE 380, 384.

CEE 361 Introduction to Environmental Engineering. (4)

fall and spring

Concepts of air and water pollution; environmental regulation, risk assessment, chemistry, water quality modeling, water and wastewater treatment systems designs. Lecture, lab. Prerequisites: ECE 312, 313. Pre- or corequisites: ECE 380, 384.

CEE 362 Unit Operations in Environmental Engineering. (3)

spring

Design and operation of unit processes for water and wastewater treatment. Prerequisite: CEE 361.

CEE 372 Transportation Engineering. (4)

fall and spring

Highway, rail, water, and air transportation. Operational characteristics and traffic control devices of each transport mode. Impact on urban form. Prerequisites: ECE 312, 313. Pre- or corequisites: ECE 380, 384.

CEE 412 Pavement Analysis and Design. (3)

fall

Design of flexible and rigid pavements for highways and airports. Surface, base, and subgrade courses. Cost analysis and pavement selection. Prerequisites: CEE 351; ECE 351.

CEE 423 Structural Design. (3)

fall

Analysis and design of reinforced concrete steel, masonry, and timber structures. Lecture, lab. Prerequisite: CEE 323. Pre- or corequisite: CEE 322.

CEE 432 Matrix and Computer Applications in Structural Engineering. (3)

spring

Matrix and computer applications to structural engineering and structural mechanics. Stiffness and flexibility methods, finite elements, and differences. Prerequisite: CEE 321.

CEE 440 Engineering Hydrology. (3)

fall

Descriptive hydrology; hydrologic cycle, models, and systems. Rain-runoff models. Hydrologic design. Concepts, properties, and basic equations of groundwater flow. Prerequisite: CEE 341.

CEE 441 Water Resources Engineering. (3)

spring

Application of the principles of hydraulics and hydrology to the engineering of water resources projects; design and operation of water resources systems; water quality. Prerequisite: CEE 341.

CEE 452 Foundations. (3)

fall

Applications of soil mechanics to foundation systems, bearing capacity, lateral earth pressure, and slope stability. Prerequisite: CEE 351.

CEE 466 Sanitary Systems Design. (3)

fall

Capacity, planning and design of water supply, domestic and storm drainage, and solid waste systems. Prerequisite: CEE 361.

CEE 467 Environmental Microbiology. (4)

fall

Overview of the microbiology of natural and human-impacted environment, microbial detection methodologies, waterborne disease outbreaks, risk assessment, and regulations. Lecture, lab. Prerequisite: CEE 361 or MIC 220.

CEE 471 Intelligent Transportation Systems. (3)

not regularly offered

Application of advanced technology to the vehicle and the roadway to solve traffic congestion, safety, and air quality problems. Prerequisite: CEE 372 or instructor approval.

CEE 475 Highway Geometric Design. (3)

spring

Design of the visible elements of the roadway. Fundamental design controls with application to rural roads, at-grade intersections, freeways, and interchanges. Lecture, recitation. Prerequisite: CEE 372.

CEE 481 Civil Engineering Project Management. (3)

once a year

Civil engineering project management and administration, planning and scheduling, cost estimating and bidding strategies, financial management, quality control and safety, and computer applications. Lecture, field trip. Prerequisites: CEE 321, 351, 372.

CEE 483 Highway Materials, Construction, and Quality. (3)

once a year

Properties of highway materials including aggregates, asphalt concrete, and portland cement concrete; construction practice; material delivery, placement, and compaction; quality control. Lecture, field trip. Prerequisites: CEE 321, 351, 372; ECE 351, 380.

CEE 486 Integrated Civil Engineering Design. (3)

fall and spring

Students are required to complete a civil engineering design in a simulated practicing engineering environment. Limited to undergraduates in their final semester. Lecture, team learning. Prerequisites: CEE 321, 341, 351, 361, 372.

General Studies: L

CEE 512 Pavement Performance and Management. (3)

not regularly offered

Pavement management systems, including data collection, evaluation, optimization, economic analysis, and computer applications for highway and airport design. Prerequisite: instructor approval.

CEE 514 Bituminous Materials and Mixture. (3)

not regularly offered

Types of bituminous materials used in pavement mixtures. Chemical composition, physical properties, desirable aggregate characteristics, optimum asphalt contents, superpave asphalt binder, mixture design. Lecture, lab. Prerequisite: ECE 351.

CEE 515 Properties of Concrete. (3)*not regularly offered*

Materials science of concrete. Cement chemistry, mechanisms of hydration, interrelationships among micro- and macro-properties of cement-based materials. Mechanical properties, failure theories, fracture mechanics of concrete materials. Cement-based composite materials and the durability aspects. Lecture, lab. Prerequisite: CEE 350 or 351.

CEE 521 Stress Analysis. (3)*fall*

Advanced topics in the analytical determination of stress and strain. Prerequisite: CEE 321.

CEE 524 Advanced Steel Structures. (3)*fall*

Strength properties of steel and their effects on structural behavior. Elastic design of steel structures. Plastic analysis and design of beams, frames, and bents. Plastic deflections. Plastic design requirements. Multistory buildings. Prerequisite: CEE 322.

CEE 526 Finite Element Methods in Civil Engineering. (3)*fall*

Finite element formulation for solutions of structural, geotechnical, and hydraulic problems. Prerequisite: CEE 432.

CEE 527 Advanced Concrete Structures. (3)*not regularly offered*

Ultimate strength design. Combined shear and torsion. Serviceability. Plastic analysis. Special systems. Prerequisite: CEE 323.

CEE 530 Prestressed Concrete. (3)*not regularly offered*

Materials and methods of prestressing. Analysis and design for flexure, shear, and torsion. Prestress losses due to friction, creep, shrinkage, and anchorage set. Statically indeterminate structures. Design of flat slabs, bridges, and composite beams. Prerequisite: CEE 323.

CEE 533 Structural Optimization. (3)*not regularly offered*

Linear and nonlinear programming. Problem formulation. Constrained and unconstrained optimization. Sensitivity analysis. Approximate techniques. FEM-based optimal design of mechanical and aerospace structures. Cross-listed as MAE 521. Credit is allowed for only CEE 533 or MAE 521. Prerequisite: instructor approval.

CEE 536 Structural Dynamics. (3)*not regularly offered*

Structures and structural members subjected to dynamic loadings, response spectra theory applications to bridges and power plants, investigations of the responses of multidegree of freedom structures, and matrix and numerical methods of analysis. Lecture, recitation. Prerequisites: CEE 321; instructor approval.

CEE 537 Topics in Structural Engineering. (1–3)*not regularly offered*

Advanced topics, including nonlinear structural analysis, experimental stress analysis, advanced finite elements, plasticity and viscoelasticity, composites, and damage mechanics. Prerequisite: instructor approval.

CEE 540 Groundwater Hydrology. (3)*fall*

Physical properties of aquifers, well pumping, subsurface flow modeling, unsaturated flow, numerical methods, land subsidence, and groundwater pollution. Prerequisite: CEE 440 or instructor approval.

CEE 541 Surface Water Hydrology. (3)*spring*

Hydrologic cycle and mechanisms, including precipitation, evaporation, and transpiration; hydrograph analysis; flood routing; statistical methods in hydrology and hydrologic design. Prerequisite: CEE 440 or instructor approval.

CEE 543 Water Resources Systems. (3)*not regularly offered*

Theory and application of quantitative planning methodologies for the design and operation of water resources systems; class projects using a computer; case studies. Prerequisite: instructor approval.

CEE 546 Free Surface Hydraulics. (3)*not regularly offered*

Derivation of 1-dimensional equations used in open channel flow analysis; computations for uniform and nonuniform flows, unsteady flow, and flood routing. Mathematical and physical models. Prerequisite: CEE 341.

CEE 547 Principles of River Engineering. (3)*not regularly offered*

Uses of rivers, study of watershed, and channel processes. Sediment sources, yield, and control; hydrologic analysis. Case studies. Prerequisite: CEE 341 or instructor approval.

CEE 548 Sedimentation Engineering. (3)*not regularly offered*

Introduction to the transportation of granular sedimentary materials by moving fluids. Degradation, aggregation, and local scour in alluvial channels. Mathematical and physical models. Prerequisite: CEE 547 or instructor approval.

CEE 550 Soil Behavior. (3)*not regularly offered*

Physicochemical aspects of soil behavior, stabilization of soils, and engineering properties of soils. Prerequisite: CEE 351.

CEE 551 Advanced Geotechnical Testing. (3)*not regularly offered*

Odometer, triaxial (static and cyclic) back pressure saturated and unsaturated samples, pore pressure measurements, closed-loop computer-controlled testing, in-situ testing, and sampling. Lecture, lab. Prerequisite: CEE 351.

CEE 552 Geological Engineering. (3)*not regularly offered*

Geological investigations for engineering purposes, case histories, geologic structure, weathering, remote sensing, geophysics, and air photo interpretation for engineering site locations. Lecture, field trips. Prerequisite: CEE 351.

CEE 553 Advanced Soil Mechanics. (3)*not regularly offered*

Application of theories of elasticity and plasticity to soils, theories of consolidation, failure theories, and response to static and dynamic loading. Prerequisite: CEE 351.

CEE 554 Shear Strength and Slope Stability. (3)*not regularly offered*

Shear strength of saturated and unsaturated soils strength-deformation relationships, time-dependent strength parameters, effects of sampling, and advanced slope stability. Prerequisite: CEE 351.

CEE 555 Advanced Foundations. (3)*not regularly offered*

Deep foundations, braced excavations, anchored bulkheads, reinforced earth, and underpinning. Prerequisite: CEE 351.

CEE 557 Hazardous Waste: Site Assessment and Mitigation Measures. (3)*not regularly offered*

Techniques for hazardous waste site assessment and mitigation. Case histories presented by instructor and guest speakers. Prerequisites: graduate standing; instructor approval.

CEE 559 Earthquake Engineering. (3)*not regularly offered*

Characteristics of earthquake motions, selection of design earthquakes, site response analyses, seismic slope stability, and liquefaction. Prerequisite: CEE 351.

CEE 560 Soil and Groundwater Remediation. (3)*fall*

Techniques for remediation of contaminated soils and groundwaters are presented with basic engineering principles. Prerequisite: instructor approval.

CEE 561 Physical-Chemical Treatment of Water and Waste. (3)*fall*

Theory and design of physical and chemical processes for the treatment of water and wastewaters. Prerequisite: CEE 361.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CEE 562 Environmental Biochemistry and Waste Treatment. (3)*spring*

Theory and design of biological waste treatment systems. Pollution and environmental assimilation of wastes. Prerequisite: CEE 362.

CEE 563 Environmental Chemistry Laboratory. (3)*fall*

Analysis of water, domestic and industrial wastes, laboratory procedures for pollution evaluation, and the control of water and waste treatment processes. Lecture, lab. Prerequisite: CEE 361.

CEE 565 Modeling and Assessment of Aquatic Systems. (3)*not regularly offered*

Development of predictive models of water quality; methods to assess environmental impacts; applications to water quality management. Prerequisite: CEE 361 or instructor approval.

CEE 566 Industrial/Hazardous Waste Treatment. (3)*not regularly offered*

Emphasis on treatment of local industrial/hazardous waste problems, including solvent recovery and metals. Lecture, project. Prerequisites: CEE 561, 563.

CEE 573 Traffic Engineering. (3)*not regularly offered*

Driver, vehicle, and roadway characteristics, laws and ordinances, traffic control devices, traffic engineering studies, and Transportation System Management measures. Prerequisite: CEE 372.

CEE 574 Highway Capacity. (3)*not regularly offered*

Highway capacity for all functional classes of highways. Traffic signalization, including traffic studies, warrants, cycle length, timing, phasing, and coordination. Prerequisite: CEE 372.

CEE 575 Traffic Flow Theory and Safety Analysis. (3)*not regularly offered*

Traffic flow theory; distributions, queuing, delay models, and car-following. Highway safety; accident records systems, accident analysis, identifying problem locations, and accident countermeasures. Prerequisite: CEE 573 or 574.

CEE 577 Urban Transportation Planning. (3)*not regularly offered*

Application of land use parameters traffic generation theory, traffic distribution and assignment models, transit analysis, and economic factors to the solution of the urban transportation problem. Prerequisite: CEE 372.

CEE 580 Practicum. (1–12)*not regularly offered*

See CEE Note 1.

CEE 590 Reading and Conference. (1–12)*not regularly offered*

See CEE Note 1.

CEE 592 Research. (1–12)*not regularly offered*

See CEE Notes 1, 2.

CEE 599 Thesis. (1–12)*not regularly offered*

See CEE Notes 1, 2.

CEE 792 Research. (1–15)*not regularly offered*

See CEE Notes 1, 2.

CEE 799 Dissertation. (1–15)*not regularly offered*

See CEE Notes 1, 2.

Department of Computer Science and Engineering

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ASSISTANT PROFESSORS

BAZZI, CANDAN, G. GANNOD, KONJEVOD,
RICHA, WAGNER

LECTURERS

DeLIBERO, B. GANNOD, NAVABI, WHITEHOUSE

Computers have a significant impact on our daily lives, and this impact is likely to be even greater in the future as computer professionals continue to develop more powerful, smaller, faster, and less expensive computing systems. Computer science and computer engineering deal with the study, design, development, construction, and application of modern computing machinery. Other important topics include computing techniques and appropriate languages for general information processing; for scientific computation; for the recognition, storage, retrieval, and processing of data of all kinds; and for the automatic control and simulation of processes.

The curricula offered by the Department of Computer Science and Engineering prepare the student to be a participant in this rapidly changing area of technology by presenting in-depth treatments of the fundamentals of computer science and computer engineering. The department offers two undergraduate degrees: a B.S. degree in Computer Science and a B.S.E. degree in Computer Systems Engineering. The following are shared objectives of the degree programs:

1. Graduates will understand current trends in information technology and be able to apply their understanding in the distributed management of information.
2. Graduates can apply the underlying principles of computer science, including mathematical and physical sciences and engineering principles.
3. Graduates will know and be able to apply system development processes, using modern tools, from the component level to the system level.
4. Graduates also will have the skills required to communicate effectively in both technical and nontechnical settings, to work effectively in teams and in a multicultural environment, to work ethically and professionally, and continue to learn independently and grow intellectually.

The Computer Systems Engineering program has the specific objective that its graduates will have the technical expertise necessary to analyze requirements and to design and implement effective solutions to problems that require the integration of hardware and software. The Computer Science program has the specific objective that its graduates will have the technical expertise necessary to analyze requirements, design, and implement effective solutions using computer science for a broad range of problems. The department strives to maintain a modern learning environment that fosters excellence, cooperation, and scholarship for faculty, students, and staff.

ADMISSION REQUIREMENTS

The admission standards for the undergraduate Computer Science and Computer Systems Engineering degree programs are currently under review and may be changing for fall 2001–spring 2002. For more information, visit the Computer Science and Engineering Advising Center in GWC 302, or call 480/965-3199 for current admission standards.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is required for the B.S. degree in Computer Science and the B.S.E. degree in Computer Systems Engineering. A minimum of 50 upper-division semester hours is required. In addition to the requirement for a cumulative GPA of 2.00 or higher, all computer science and computer systems engineering students must obtain a minimum grade of “C” in all CSE courses used for degree credit.

GRADUATION REQUIREMENTS

In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See “University Graduation Requirements,” page 74.

DEGREES

Computer Science—B.S.

The faculty in the Department of Computer Science and Engineering offer a B.S. degree that prepares the student for a career in computer science. A student pursuing a B.S. degree must complete the First-Year Composition requirement, the General Studies requirement, department degree requirements, the computer science core courses, a senior-level breadth requirement in the major, technical electives, and unrestricted electives. For more information, visit the department in GWC 206, call 480/965-3190, send e-mail to cse_graduate.office@asu.edu, or access the department’s Web site at cse.asu.edu.

The following table specifies departmental requirements for the B.S. degree in Computer Science.

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
— or —	
ENG 105 Advanced First-Year Composition (3)	
HU/SB elective chosen with an advisor (3)	
— or —	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/Department Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i>	
HU/SB electives	18

Literacy and Critical Inquiry

L elective.....	3
ECE 400 Engineering Communications L	3
or approved CSE L course (3)	
Total	6

Natural Sciences/Basic Sciences

PHY 121 University Physics I: Mechanics SQ ¹	3
PHY 122 University Physics Laboratory I SQ ¹	1
PHY 131 University Physics II: Electricity and Magnetism SQ ²	3
PHY 132 University Physics Laboratory II SQ ²	1
Science elective ³	4
Total	12

Mathematical Studies

ECE 380 Probability and Statistics for Engineering Problem Solving CS	3
MAT 243 Discrete Mathematical Structures	3
MAT 270 Calculus with Analytic Geometry I MA	4
MAT 271 Calculus with Analytic Geometry II MA	4
MAT 272 Calculus with Analytic Geometry III MA	4
MAT 342 Linear Algebra	3
Total	21
General Studies/department requirement total.....	57

Computer Science Core

CSE 120 Digital Design Fundamentals.....	3
CSE 200 Concepts of Computer Science CS	3
CSE 210 Object-Oriented Design and Data Structures CS	3
CSE 225 Assembly Language Programming and Microprocessors (Motorola)	4
or CSE 226 Assembly Language Programming and Microprocessors (Intel) (4)	
CSE 240 Introduction to Programming Languages	3
CSE 310 Data Structures and Algorithms.....	3
CSE 330 Computer Organization and Architecture	3
CSE 340 Principles of Programming Languages	3
CSE 355 Introduction to Theoretical Computer Science	3
CSE 360 Introduction to Software Engineering.....	3
CSE 430 Operating Systems	3
Total computer science core.....	34
400-level CSE computer science breadth requirement	18
Technical electives ⁴	6

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Unrestricted electives.....	7
Total	31
Total degree requirements.....	128

- ¹ Both PHY 121 and 122 must be taken to secure SQ credit.
- ² Both PHY 131 and 132 must be taken to secure SQ credit.
- ³ Each student must complete a four-credit laboratory science course for majors in the discipline that satisfies the SQ portion of the General Studies requirement. See an advisor for approved listing.
- ⁴ Each student must complete six hours of courses chosen from the computer science technical elective list and approved by the student's advisor. See an advisor for approved listing.

**Computer Science
Program of Study
Typical Four-Year Sequence**

First Year

First Semester

CSE 200 Concepts of Computer Science <i>CS</i>	3
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
HU/SB and awareness area course ¹	3
Unrestricted elective	3
Total	16

Second Semester

CSE 120 Digital Design Fundamentals.....	3
CSE 210 Object-Oriented Design and Data Structures <i>CS</i>	3
ENG 102 First-Year Composition.....	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
Unrestricted elective	4
Total	17

Second Year

First Semester

CSE 240 Introduction to Programming Languages.....	3
MAT 243 Discrete Mathematical Structures.....	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ²	3
PHY 122 University Physics Laboratory I <i>SQ</i> ²	1
HU/SB and awareness area course ¹	3
Total	17

Second Semester

CSE 225 Assembly Language Programming and Microprocessors (Motorola).....	4
or CSE 226 Assembly Language Programming and Microprocessors (Intel) (4)	
CSE 310 Data Structures and Algorithms.....	3
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ³	3
PHY 132 University Physics Laboratory II <i>SQ</i> ³	1
HU/SB and awareness area course ¹	3
L elective.....	3
Total	17

Third Year

First Semester

CSE 330 Computer Organization and Architecture.....	3
CSE 340 Principles of Programming Languages.....	3
MAT 342 Linear Algebra.....	3
HU/SB and awareness area course ¹	3
Laboratory science for engineering majors <i>SQ</i> ⁴	4
Total	16

Second Semester

CSE 355 Introduction to Theoretical Computer Science.....	3
CSE 360 Introduction to Software Engineering.....	3
CSE 430 Operating Systems.....	3
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
HU/SB and awareness area course ¹	3
Total	15

Fourth Year

First Semester

ECE 400 Engineering Communications <i>L</i>	3
or approved CSE <i>L</i> course (3)	
Technical elective.....	3
400-level CSE computer science breadth electives.....	9
Total	15

Second Semester

400-level CSE computer science breadth electives.....	9
HU/SB and awareness area course ¹	3
Technical elective.....	3
Total	15

- ¹ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU and SB requirements.
- ² Both PHY 121 and 122 must be taken to secure SQ credit.
- ³ Both PHY 131 and 132 must be taken to secure SQ credit.
- ⁴ Each student must complete a four-credit laboratory science course for majors in the discipline that satisfies the SQ portion of the General Studies requirement. See an advisor for approved listing.

Computer Systems Engineering—B.S.E.

The Department of Computer Science and Engineering offers a B.S.E. degree that prepares the student for a career in computer systems engineering. This degree program provides training in both engineering and computer science. The following table specifies departmental requirements for the B.S.E. degree in Computer Systems Engineering.

First-Year Composition

Choose among the course combinations below.....	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
————— <i>or</i> —————	
ENG 105 Advanced First-Year Composition (3)	
HU/SB elective chosen with an advisor (3)	
————— <i>or</i> —————	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/Department Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i>	
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
HU and SB electives.....	12
Total	15
<i>Literacy and Critical Inquiry</i>	
CSE 423 Microcomputer System Hardware <i>L</i>	3
or CSE 438 Systems Programming <i>L</i> (3)	
ECE 300 Intermediate Engineering Design <i>L</i>	3
Total	6

Natural Sciences/Basic Sciences

CHM 114 General Chemistry for Engineers <i>SQ</i>.....4	
or CHM 116 General Chemistry <i>SQ</i> (4)	
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹.....3	
PHY 122 University Physics Laboratory I <i>SQ</i> ¹.....1	
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ².....3	
PHY 132 University Physics Laboratory II <i>SQ</i> ².....1	
PHY 361 Introductory Modern Physics.....3	
Total.....15	

Mathematical Studies

MAT 243 Discrete Mathematical Structures.....3	
MAT 270 Calculus with Analytic Geometry I <i>MA</i>.....4	
MAT 271 Calculus with Analytic Geometry II <i>MA</i>.....4	
MAT 272 Calculus with Analytic Geometry III <i>MA</i>.....4	
MAT 274 Elementary Differential Equations <i>MA</i>.....3	
MAT 342 Linear Algebra.....3	
Total.....21	
General Studies/department requirement total.....57	

Engineering Core

CSE 200 Concepts of Computer Science <i>CS</i>.....3	
CSE 225 Assembly Language Programming and Microprocessors (Motorola).....4	
ECE 100 Introduction to Engineering Design <i>CS</i>.....4	
ECE 201 Electrical Networks I.....4	
ECE 210 Engineering Mechanics I: Statics.....3	
ECE 334 Electronic Devices and Instrumentation.....4	
Total.....22	

Computer Science Core

CSE 120 Digital Design Fundamentals.....3	
CSE 210 Object-Oriented Design and Data Structures <i>CS</i>.....3	
CSE 240 Introduction to Programming Languages.....3	
CSE 310 Data Structures and Algorithms.....3	
CSE 330 Computer Organization and Architecture.....3	
CSE 340 Principles of Programming Languages.....3	
CSE 355 Introduction to Theoretical Computer Science.....3	
CSE 360 Introduction to Software Engineering.....3	
CSE 421 Microprocessor System Design I.....4	
CSE 422 Microprocessor System Design II.....4	
CSE 430 Operating Systems.....3	
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>.....3	
Technical electives ³.....5	
Total.....43	
Degree requirement total.....128	

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

³ Each student must complete five hours of courses chosen from the computer science technical elective list and approved by the student's advisor. See an advisor for approved listing.

**Computer Systems Engineering
Program of Study
Typical Four-Year Sequence**

First Year

First Semester

CSE 200 Concepts of Computer Science <i>CS</i>.....3	
ECE 100 Introduction to Engineering Design <i>CS</i>.....4	
or CSE 120 Digital Design Fundamentals (3)	

ECN 111 Macroeconomic Principles <i>SB</i>.....3	
or ECN 112 Macroeconomic Principles (3)	
ENG 101 First-Year Composition.....3	
MAT 270 Calculus with Analytic Geometry I <i>MA</i>.....4	
Total.....17	

Second Semester

CHM 114 General Chemistry for Engineers <i>SQ</i>.....4	
CSE 120 Digital Design Fundamentals.....3	
or ECE 100 Introduction to Engineering Design <i>CS</i> (4)	
CSE 210 Object-Oriented Design and Data Structures <i>CS</i>.....3	
ENG 102 First-Year Composition.....3	
MAT 271 Calculus with Analytic Geometry II <i>MA</i>.....4	
Total.....17	

Second Year

First Semester

CSE 225 Assembly Language Programming and Microprocessors (Motorola).....4	
MAT 243 Discrete Mathematical Structures.....3	
MAT 272 Calculus with Analytic Geometry III <i>MA</i>.....4	
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹.....3	
PHY 122 University Physics Laboratory I <i>SQ</i> ¹.....1	
Total.....15	

Second Semester

CSE 240 Introduction to Programming Languages.....3	
CSE 330 Computer Organization and Architecture.....3	
ECE 210 Engineering Mechanics I: Statics.....3	
MAT 274 Elementary Differential Equations <i>MA</i>.....3	
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ².....3	
PHY 132 University Physics Laboratory II <i>SQ</i> ².....1	
Total.....16	

Third Year

First Semester

CSE 310 Data Structures and Algorithms.....3	
CSE 421 Microprocessor System Design I.....4	
ECE 300 Intermediate Engineering Design <i>L</i>.....3	
MAT 342 Linear Algebra.....3	
HU/SB and awareness area course ³.....3	
Total.....16	

Second Semester

CSE 340 Principles of Programming Languages.....3	
CSE 360 Introduction to Software Engineering.....3	
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>.....3	
PHY 361 Introductory Modern Physics.....3	
HU/SB and awareness area course ³.....3	
Total.....15	

Fourth Year

First Semester

CSE 355 Introduction to Theoretical Computer Science.....3	
CSE 422 Microprocessor System Design II.....4	
CSE 430 Operating Systems.....3	
ECE 201 Electrical Networks I.....4	
HU/SB and awareness area course ³.....3	
Total.....17	

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Second Semester

CSE 423 Microcomputer System Hardware <i>L</i>	3
or CSE 438 Systems Programming <i>L</i> (3)	
ECE 334 Electronic Devices and Instrumentation	4
HU/SB and awareness area course ³	3
Technical electives	5
Total	15

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

³ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU and SB requirements.

COMPUTER SCIENCE AND ENGINEERING (CSE)**CSE 100 Principles of Programming with C++.** (3)

fall, spring, summer

Principles of problem solving using C++, algorithm design, structured programming, fundamental algorithms and techniques, and computer systems concepts. Social and ethical responsibility. Lecture, lab. Prerequisite: MAT 170.

General Studies: CS

CSE 110 Principles of Programming with Java. (3)

fall, spring, summer

Concepts of problem solving using Java, algorithm design, structured programming, fundamental algorithms and techniques, and computer systems concepts. Social and ethical responsibility. Lecture, lab. Prerequisite: MAT 170.

CSE 120 Digital Design Fundamentals. (3)

fall, spring, summer

Number systems, conversion methods, binary and complement arithmetic, Boolean algebra, circuit minimization, ROMs, PLAs, flipflops, synchronous sequential circuits. Lecture, lab. Cross-listed as EEE 120. Credit is allowed for only CSE 120 or EEE 120. Prerequisite: computer literacy.

CSE 180 Computer Literacy. (3)

fall, spring, summer

Introduction to personal computer operations and their place in society. Problem-solving approaches using databases, spreadsheets, and word processing. May be taken for credit on either Windows or Macintosh, but not both. Lecture, demonstration. Prerequisite: nonmajor.

General Studies: CS

CSE 181 Applied Problem Solving with Visual BASIC. (3)

fall, spring, summer

Introduction of systematic definition of problems, solution formulation, and method validation. Computer solution using Visual BASIC required for projects. Lecture, lab. Prerequisites: MAT 117; nonmajor.

General Studies: CS

CSE 183 Applied Problem Solving with FORTRAN. (3)

not regularly offered

Human-oriented, systems approach to problem definition, formulation, and solution using FORTRAN. Computer solution required for projects. Prerequisites: MAT 170; nonmajor.

General Studies: CS

CSE 185 Internet and the World Wide Web. (3)

fall and spring

Fundamental Internet concepts, World Wide Web browsing, publishing, searching, advanced Internet productivity tools.

CSE 200 Concepts of Computer Science. (3)

fall, spring, summer

Overview of algorithms, languages, computing systems, theory. Problem solving by programming with a high-level language (Java or other). Lecture, lab. Prerequisite: CSE 100 or 110 or one year of high school programming with Java or C++ or PASCAL.

General Studies: CS

CSE 210 Object-Oriented Design and Data Structures. (3)

fall, spring, summer

Object-oriented design, static and dynamic data structures (strings, stacks, queues, binary trees), recursion, searching, and sorting. Professional responsibility. Prerequisite: CSE 200.

General Studies: CS

CSE 225 Assembly Language Programming and Microprocessors (Motorola). (4)

fall, spring, summer

Assembly language programming, including input/output programming and exception/interrupt handling. Register-level computer organization, I/O interfaces, assemblers, and linkers. Motorola-based assignments. Lecture, lab. Cross-listed as EEE 225. Credit is allowed for only CSE 225 or EEE 225. Prerequisites: CSE 100 (or 110 or 200); CSE 120 or EEE 120.

CSE 226 Assembly Language Programming and Microprocessors (Intel). (4)

fall and spring

CPU/memory/peripheral device interfaces and programming. System buses, interrupts, serial and parallel I/O, DMA, coprocessors. Intel-based assignments. Lecture, lab. Cross-listed as EEE 226. Credit is allowed for only CSE 226 or EEE 226. Prerequisites: CSE 100 (or 110 or 200); CSE 120 or EEE 120.

CSE 240 Introduction to Programming Languages. (3)

fall, spring, summer

Introduction to the procedural (C++), applicative (LISP), and declarative (Prolog) languages. Lecture, lab. Prerequisite: CSE 210.

CSE 310 Data Structures and Algorithms. (3)

fall, spring, summer

Advanced data structures and algorithms, including stacks, queues, trees (B, B+, AVL), and graphs. Searching for graphs, hashing, external sorting. Lecture, lab. Prerequisites: CSE 210; MAT 243.

CSE 330 Computer Organization and Architecture. (3)

fall and spring

Instruction set architecture, processor performance and design; datapath, control (hardwired, microprogrammed), pipelining, input/output. Memory organization with cache, virtual memory. Prerequisite: CSE 225 (or 226) or EEE 225 (or 226).

CSE 340 Principles of Programming Languages. (3)

fall and spring

Introduction to language design and implementation. Parallel, machine-dependent and declarative features; type theory; specification, recognition, translation, run-time management. Prerequisites: CSE 225 (or 226) or EEE 225 (or 226); CSE 240, 310.

CSE 355 Introduction to Theoretical Computer Science. (3)

fall and spring

Introduction to formal language theory and automata, Turing machines, decidability/undecidability, recursive function theory, and introduction to complexity theory. Prerequisite: CSE 310.

CSE 360 Introduction to Software Engineering. (3)

fall, spring, summer

Software life cycle models; project management, team development environments and methodologies; software architectures; quality assurance and standards; legal, ethical issues. Prerequisites: CSE 210, 240.

CSE 408 Multimedia Information Systems. (3)

fall

Design, use, and applications of multimedia systems. Introduction to acquisition, compression, storage, retrieval, and presentation of data from different media such as images, text, voice, and alphanumeric. Prerequisite: CSE 310.

CSE 412 Database Management. (3)

fall and spring

Introduction to DBMS concepts. Data models and languages. Relational database theory. Database security/integrity and concurrency. Prerequisite: CSE 310.

CSE 420 Computer Architecture I. (3)

once a year

Computer architecture. Performance versus cost tradeoffs. Instruction set design. Basic processor implementation and pipelining. Prerequisite: CSE 330.

CSE 421 Microprocessor System Design I. (4)

fall and spring

Assembly language programming and logical hardware design of systems using 8-bit microprocessors and microcontrollers. Fundamental concepts of digital system design. Reliability and social, legal implications. Lecture, lab. Prerequisite: CSE 225 or EEE 225.

CSE 422 Microprocessor System Design II. (4)

fall and spring

Design of microcomputer systems using contemporary logic and microcomputer system components. Requires assembly language programming. Prerequisite: CSE 421.

CSE 423 Microcomputer System Hardware. (3)*once a year*

Information and techniques presented in CSE 422 are used to develop the hardware design of a multiprocessor, multiprogramming, microprocessor-based system. Prerequisite: CSE 422.

*General Studies: L***CSE 428 Computer-Aided Processes. (3)***not regularly offered*

Hardware and software considerations for computerized manufacturing systems. Specific concentration on automatic inspection, numerical control, robotics, and integrated manufacturing systems.

Prerequisite: CSE 330.

CSE 430 Operating Systems. (3)*fall and spring*

Operating system structure and services, processor scheduling, concurrent processes, synchronization techniques, memory management, virtual memory, input/output, storage management, and file systems. Prerequisites: CSE 330, 340.

CSE 434 Computer Networks. (3)*fall and spring*

Cryptography fundamentals; data compression; error handling; flow control; multihop routing; network protocol algorithms; network reliability, timing, security; physical layer basics. Prerequisite: CSE 330.

CSE 438 Systems Programming. (3)*once a year*

Design and implementation of systems programs, including text editors, file utilities, monitors, assemblers, relocating linking loaders, I/O handlers, and schedulers. Prerequisite: CSE 421 or instructor approval.

*General Studies: L***CSE 440 Compiler Construction I. (3)***once a year*

Introduction to programming language implementation. Implementation strategies such as compilation, interpretation, and translation. Major compilation phases such as lexical analysis, semantic analysis, optimization, and code generation. Prerequisites: CSE 340, 355.

CSE 445 Distributed Computing with Java and CORBA. (3)*fall and spring*

Frameworks for distributed software components. Foundations of client-server computing and architectures for distributed object systems. Dynamic discovery and invocation. Lecture, projects. Prerequisite: CSE 360 or instructor approval.

CSE 446 Client-Server User Interfaces. (3)*spring*

Client-server model and its use in creating and managing window interfaces. Toolkits and libraries including X11, Microsoft Foundation Classes, and Java Abstract Window Toolkit. Lecture, projects. Prerequisite: CSE 310 or instructor approval.

CSE 450 Design and Analysis of Algorithms. (3)*fall and spring*

Design and analysis of computer algorithms using analytical and empirical methods; complexity measures, design methodologies, and survey of important algorithms. Prerequisite: CSE 310.

CSE 457 Theory of Formal Languages. (3)*once a year*

Theory of grammar, methods of syntactic analysis and specification, types of artificial languages, relationship between formal languages, and automata. Prerequisite: CSE 355.

CSE 459 Logic for Computing Scientists. (3)*not regularly offered*

Propositional logic, syntax and semantics, proof theory versus model theory, soundness, consistency and completeness, first order logic, logical theories, automated theorem proving, ground resolution, pattern matching unification and resolution, Dijkstras logic, proof obligations, and program proving. Prerequisite: CSE 355.

CSE 460 Software Analysis and Design. (3)*fall and spring*

Requirements analysis and design; architecture and patterns; representations of software; formal methods; component-based development. Lecture, projects. Prerequisite: CSE 360.

CSE 461 Software Engineering Project I. (3)*fall and spring*

First of two-course software team-development sequence. Planning, management, design, and implementation using object-oriented technology, CASE tools, CMM-level-5 guidelines. Lecture, lab, oral and written communications. Prerequisite: CSE 360.

CSE 462 Software Engineering Project II. (3)*fall and spring*

Second of two-course software team-development sequence. Software evolution, maintenance, reengineering, reverse engineering, component-based development, and outsourcing. Lecture, lab, oral and written communications. Prerequisite: CSE 461.

CSE 470 Computer Graphics. (3)*fall and spring*

Display devices, data structures, transformations, interactive graphics, 3-dimensional graphics, and hidden line problem. Prerequisites: CSE 310; MAT 342.

CSE 471 Introduction to Artificial Intelligence. (3)*fall and spring*

State space search, heuristic search, games, knowledge representation techniques, expert systems, and automated reasoning. Prerequisites: CSE 240, 310.

CSE 473 Nonprocedural Programming Languages. (3)*not regularly offered*

Functional and logic programming using languages like Lucid and Prolog. Typical applications would be a Screen Editor and an Expert System. Prerequisite: CSE 355.

CSE 476 Introduction to Natural Language Processing. (3)*not regularly offered*

Principles of computational linguistics, formal syntax, and semantics, as applied to the design of software with natural (human) language I/O. Prerequisite: CSE 310 or instructor approval.

CSE 477 Introduction to Computer-Aided Geometric Design. (3)*once a year*

Introduction to parametric curves and surfaces, Bezier and B-spline interpolation, and approximation techniques. Prerequisites: CSE 210, 470; MAT 342.

CSE 507 Virtual Reality Systems. (3)*not regularly offered*

Computer generated 3D environments, simulation of reality, spatial presence of virtual objects, technologies of immersion, tracking systems. Lecture, lab. Prerequisite: CSE 408 or 470 or 508 or instructor approval.

CSE 508 Digital Image Processing. (3)*once a year*

Digital image fundamentals, image transforms, image enhancement and restoration techniques, image encoding, and segmentation methods. Prerequisite: EEE 303 or instructor approval.

CSE 510 Database Management System Implementation. (3)*once a year*

Implementation of database systems. Data storage, indexing, querying, and retrieval. Query optimization and execution, concurrency control, and transaction management. Prerequisite: CSE 412.

CSE 512 Distributed Database Systems. (3)*once a year*

Distributed database design, query processing, and transaction processing. Distributed database architectures and interoperability. Emerging technology. Prerequisite: CSE 412.

CSE 513 Rules in Database Systems. (3)*not regularly offered*

Declarative and active rules. Logic as a data model. Evaluation and query optimization. Triggers and ECA rules. Current research topics. Prerequisite: CSE 412.

CSE 514 Object-Oriented Database Systems. (3)*not regularly offered*

Object-oriented data modeling, definition, manipulation. Identity and inheritance. Query languages. Schema evolution. Versioning. Distributed object management. Extended relational systems. Prerequisite: CSE 412.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CSE 515 Multimedia and Web Databases. (3)*spring*

Data models for multimedia and Web data; query processing and optimization for inexact retrieval; advanced indexing, clustering, and search techniques. Prerequisites: CSE 408, 412.

CSE 517 Hardware Design Languages. (3)*once a year*

Introduction to hardware design languages. Modeling concepts for specification, simulation, and synthesis. Prerequisite: CSE 423 or EEE 425 or instructor approval.

CSE 518 Synthesis with Hardware Design Languages. (3)*not regularly offered*

Modeling VLSI design in hardware design languages for synthesis. Transformation of language-based designs to physical layout. Application of synthesis tools. Prerequisite: CSE 517.

CSE 520 Computer Architecture II. (3)*fall*

Computer architecture description languages, computer arithmetic, memory-hierarchy design, parallel, vector, multiprocessors, and input/output. Prerequisites: CSE 420, 430.

CSE 521 Microprocessor Applications. (4)*not regularly offered*

Microprocessor technology and its application to the design of practical digital systems. Hardware, assembly language programming, and interfacing of microprocessor-based systems. Lecture, lab. Prerequisite: CSE 421.

CSE 523 Microcomputer Systems Software. (3)*not regularly offered*

Developing system software for a multiprocessor, multiprogramming, microprocessor-based system using information and techniques presented in CSE 421, 422. Prerequisite: CSE 422.

CSE 526 Parallel Processing. (3)*not regularly offered*

Real and apparent concurrency. Hardware organization of multiprocessors, multiple computer systems, scientific attached processors, and other parallel systems. Prerequisite: CSE 330 or 423.

CSE 530 Operating System Internals. (3)*once a year*

Implementation of process management and synchronization, system call and interrupt handling, memory management, device drivers and file systems in UNIX. Prerequisites: CSE 430; knowledge of C language.

CSE 531 Distributed and Multiprocessor Operating Systems. (3)*once a year*

Distributed systems architecture, remote file access, message-based systems, object-based systems, client/server paradigms, distributed algorithms, replication and consistency, and multiprocessor operating systems. Prerequisite: CSE 530 or instructor approval.

CSE 532 Advanced Operating System Internals. (3)*not regularly offered*

Memory, processor, process and communication management, and concurrency control in the Windows NT multiprocessor and distributed operating system kernels and servers. Prerequisites: CSE 530, 531 (or 536).

CSE 534 Advanced Computer Networks. (3)*fall and spring*

Advanced network protocols and infrastructure, applications of high-performance networks to distributed systems, high-performance computing and multimedia domains, special features of networks. Prerequisite: CSE 434.

CSE 536 Theory of Operating Systems. (3)*spring*

Protection. Communication and synchronization in distributed systems, distributed file systems, deadlock theory, virtual memory theory, and uniprocessor and multiprocessor thread management. Prerequisite: CSE 430.

CSE 537 ATM Network Design. (3)*not regularly offered*

Principles of ATM networks, switch architecture, traffic management, call and connection control, routing, internetworking with ATM networks, signaling, and OAM. Prerequisite: CSE 434.

CSE 539 Applied Cryptography. (3)*spring*

Use of cryptography for secure protocols over networked systems, including signatures, certificates, timestamps, electrons, digital cash, and other multiparty coordination. Prerequisite: CSE 310 or instructor approval.

CSE 540 Compiler Construction II. (3)*not regularly offered*

Formal parsing strategies, optimization techniques, code generation, extensibility and transportability considerations, and recent developments. Prerequisite: CSE 440.

CSE 545 Programming Language Design. (3)*not regularly offered*

Language constructs, extensibility and abstractions, and runtime support. Language design process. Prerequisite: CSE 440.

CSE 550 Combinatorial Algorithms and Intractability. (3)*once a year*

Combinatorial algorithms, nondeterministic algorithms, classes P and NP, NP-hard and NP-complete problems, and intractability. Design techniques for fast combinatorial algorithms. Prerequisite: CSE 450.

CSE 555 Theory of Computation. (3)*once a year*

Rigorous treatment of regular languages, context-free languages, Turing machines and decidability, reducibility, and other advanced topics in computability theory. Prerequisite: CSE 355 or instructor approval.

CSE 556 Expert Systems. (3)*not regularly offered*

Knowledge acquisition and representation, rule-based systems, frame-based systems, validation of knowledge bases, inexact reasoning, and expert database systems. Prerequisite: CSE 471.

CSE 562 Software Process Automation. (3)*once a year*

Representing the software process; creating a measured and structured working environment; using, constructing, and adapting component-based tools. Prerequisite: CSE 360.

CSE 563 Software Requirements and Specification. (3)*not regularly offered*

Examines the definitional stage of software development; analysis of specification representations, formal methods, and techniques emphasizing important application issues. Prerequisite: CSE 460.

CSE 564 Software Design. (3)*once a year*

Examines software design issues and techniques. Includes a survey of design representations and a comparison of design methods. Prerequisite: CSE 460.

CSE 565 Software Verification, Validation, and Testing. (3)*once a year*

Test planning, requirements-based and code-based testing techniques, tools, reliability models, and statistical testing. Prerequisite: CSE 460.

CSE 566 Software Project, Process, and Quality Management. (3)*once a year*

Project management, risk management, configuration management, quality management, and simulated project management experiences. Prerequisite: CSE 360.

CSE 570 Advanced Computer Graphics I. (3)*once a year*

Hidden surface algorithms, lighting models, and shading techniques. User interface design. Animation techniques. Fractals and stochastic models. Raster algorithms. Prerequisite: CSE 470.

CSE 571 Artificial Intelligence. (3)*once a year*

Definitions of intelligence, computer problem solving, game playing, pattern recognition, theorem proving, and semantic information processing; evolutionary systems; heuristic programming. Prerequisite: CSE 471.

CSE 573 Advanced Computer Graphics II. (3)*once a year*

Modeling of natural phenomena: terrain, clouds, fire, water, and trees. Particle systems, deformation of solids, antialiasing, and volume visualization. Lecture, lab. Prerequisite: CSE 470.

CSE 574 Planning and Learning Methods in AI. (3)*once a year*

Reasoning about time and action, plan synthesis and execution, improving planning performance, applications to manufacturing intelligent agents. Prerequisite: CSE 471 (or its equivalent).

CSE 575 Decision-Making Strategies in AI. (3)*not regularly offered*

Automatic knowledge acquisition, automatic analysis/synthesis of strategies, distributed planning/problem solving, causal modeling, predictive human-machine environments. Prerequisite: CSE 471 or 571 (or its equivalent).

CSE 576 Topics in Natural Language Processing. (3)*not regularly offered*

Comparative parsing strategies, scoping and reference problems, nonfirst-order logical semantic representations, and discourse structure. Prerequisite: CSE 476 or instructor approval.

CSE 577 Advanced Computer-Aided Geometric Design I. (3)*once a year*

General interpolation; review of curve interpolation and approximation; spline curves; visual smoothness of curves; parameterization of curves; introduction to surface interpolation and approximation. Prerequisites: both CSE 470 and 477 or only instructor approval.

CSE 578 Advanced Computer-Aided Geometric Design II. (3)*not regularly offered*

Coons patches and Bezier patches; triangular patches; arbitrarily located data methods; geometry processing of surfaces; higher dimensional surfaces. Prerequisites: both CSE 470 and 477 or only instructor approval.

CSE 579 NURBS: Nonuniform Rational B-Splines. (3)*not regularly offered*

Projective geometry, NURBS-based modeling, basic theory of conics and rational Bezier curves, rational B-splines, surfaces, rational surfaces, stereographic maps, quadrics, IGES data specification. Prerequisites: CSE 470, 477.

CSE 593 Applied Project. (1–12)*not regularly offered***CSE 598 Special Topics. (1–4)***not regularly offered*

They are responsible for the design and development of radio and television transmitters and receivers, telephone networks and switching systems, computer systems, and electric power generation and distribution. Within the broad scope of these systems, the electrical engineer is concerned with a challenging and diverse array of design and development problems.

Electrical engineers design minuscule semiconductor integrated circuits that contain many thousands of elementary devices. These engineers design systems for automatically controlling mechanical devices and a variety of processes. These engineers are responsible for the design of satellite communication links as well as patient monitoring systems for hospitals. The development of the microprocessor has expanded the opportunities for electrical engineers to improve the design of familiar products since these devices are now incorporated in automobiles, consumer and office products, entertainment systems, and a vast variety of test and measurement instruments and machine tools.

Students who earn a B.S.E. degree in Electrical Engineering will be involved in a variety of electrical and electronic problems in the course of their careers. To ensure the necessary breadth of knowledge, the Electrical Engineering curriculum includes basic (core) engineering courses and courses in networks and electronic circuits, electromagnetic fields and waves, microprocessors, communication and control systems, solid-state electronics, electrical power systems, and other specialty courses.

ELECTRICAL ENGINEERING—B.S.E.

The goal of the Electrical Engineering undergraduate program is to prepare the graduates for entry-level positions as electrical engineers for the broad range of opportunities available in industrial, commercial, and governmental organizations, and to prepare the graduates for continued learning experiences either in a formal graduate program or in continuing education applications.

The curriculum in Electrical Engineering builds upon the base provided by the engineering core. Beyond the engineering core, the curriculum includes a number of required electrical engineering and technical elective courses. Approved technical elective courses serve to provide students with an opportunity either to broaden their background in electrical engineering or to study, in greater depth, technical subjects in which they have special interests. Successful completion of the curriculum leaves the student prepared to embark on a career in electrical engineering or to pursue advanced education in graduate school.

The engineering design experience is structured around four backbone courses employing engineering teams: ECE 100 Introduction to Engineering Design (freshman year), ECE 300 Intermediate Engineering Design (junior year), EEE 491 Senior Design Laboratory I, and EEE 492 Senior Design Laboratory II. The integrated experience is strengthened with required courses: EEE 120 Digital Design Fundamentals, EEE 225 Assembly Language Programming and Microprocessors (Motorola), EEE 226 Assembly Language Programming and Microprocessors (Intel), EEE 303 Signals and Systems, and EEE 360 Energy Conversion and Transport. Students focus on design pertaining to specific

Department of Electrical Engineering

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REGENTS' PROFESSORS

BALANIS, FERRY

PROFESSORS

BACKUS, CROUCH, EL-GHAZALY, GOODNICK, GORUR,
HEYDT, HIGGINS, HOPPENSTEADT, HUI, KARADY,
KOZICKI, PALAIS, PAN, ROEDEL, SCHRODER, SI,
SPANIAS, THORNTON, Y. ZHANG

ASSOCIATE PROFESSORS

ABERLE, ALLEE, BIRD, CHAKRABARTI, COCHRAN,
EL-SHARAWY, GREENEICH, GRONDIN, HOLBERT, KIM,
LAI, MORRELL, RODRIGUEZ, SHEN, SKROMME,
TSAKALIS, TYLAVSKY

ASSISTANT PROFESSORS

AYYANAR, CAPONE, DUMAN, JOO, KARAM,
PAPANDEOU-SUPPAPPOLA, REISSLEIN,
VASILESKA, YAZDI, J. ZHANG

The professional activities of electrical engineers directly affect the everyday lives of most of the world's population.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

electrical engineering areas in their senior technical electives before the culminating, capstone design experience in EEE 488 and EEE 489.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is necessary for the B.S.E. degree in Electrical Engineering. A minimum of 50 upper-division semester hours is required.

GRADUATION REQUIREMENTS

A student must earn a grade of "C" or higher in the mathematics and physics courses listed in the program of study. Each mathematics and physics course in the program of study must be completed with a "C" or higher before enrolling in any course that requires that mathematics or physics course as a prerequisite. The student must also have an overall GPA of at least 2.00 for the following group of courses: CSE 100; ECE 201, 300, 334, 352; all courses with an EEE prefix; and all other courses used as technical electives.

In addition to fulfilling school and major requirements, students must satisfy all university graduation requirements. See "University Graduation Requirements," page 74.

COURSE REQUIREMENTS

The specific course requirements for the B.S.E. degree in Electrical Engineering follow.

First-Year Composition¹

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
-----or-----	
ENG 105 Advanced First-Year Composition (3)	
Elective (requires departmental approval) (3)	
-----or-----	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i>	
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
HU courses.....	6-9
SB course(s).....	3-6
Minimum total	15
<i>Literacy and Critical Inquiry</i>	
ECE 300 Intermediate Engineering Design <i>L</i>	3
Department approved L course	4
Total	7
<i>Natural Sciences/Basic Sciences</i>	
CHM 114 General Chemistry for Engineers <i>SQ</i>	4
or CHM 116 General Chemistry <i>SQ</i> (4)	
PHY 121 University Physics I: Mechanics <i>SQ</i> ^{1, 2}	3
PHY 122 University Physics Laboratory I <i>SQ</i> ^{1, 2}	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ^{1, 3}	3
PHY 132 University Physics Laboratory II <i>SQ</i> ^{1, 3}	1
PHY 241 University Physics III ¹	3
Total	15

Mathematical Studies

ECE 100 Introduction to Engineering Design <i>CS</i>	4
MAT 270 Calculus with Analytic Geometry I <i>MA</i> ¹	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i> ¹	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i> ¹	4
MAT 274 Elementary Differential Equations <i>MA</i> ¹	3
MAT 342 Linear Algebra ¹	3
MAT 362 Advanced Mathematics for Engineers and Scientists I ¹	3
Total	25
General Studies/school requirements total.....	62

Engineering Core

ECE 201 Electrical Networks I	4
ECE 314 Engineering Mechanics.....	4
ECE 334 Electronic Devices and Instrumentation	4
ECE 352 Properties of Electronic Materials	4
EEE 225 Assembly Language Programming and Microprocessors (Motorola)	4
or EEE 226 Assembly Language Programming and Microprocessors (Intel)(4)	
Total	20

¹ A minimum grade of "C" is required.

² Both PHY 121 and 122 must be taken to secure SQ credit.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

Electrical Engineering Major

The following courses are required to fulfill the Electrical Engineering major:

CSE 100 Principles of Programming with C++ <i>CS</i>	3
EEE 120 Digital Design Fundamentals.....	3
EEE 302 Electrical Networks II	3
EEE 303 Signals and Systems.....	3
EEE 340 Electromagnetic Engineering I	4
EEE 350 Random Signal Analysis.....	3
EEE 360 Energy Conversion and Transport.....	4
Total	23

The program in Electrical Engineering requires a total of 17 semester hours of technical electives. With department approval, a maximum of two technical electives may be taken outside electrical engineering. Qualified students may choose from approved courses in business, engineering, mathematics, and the sciences at or above the 300-level, including graduate courses. Students must have a GPA of not less than 3.00 and approval of the dean to enroll in EEE graduate-level courses. To ensure breadth of knowledge, students *must* select courses from at least three of the following six areas. In addition, to ensure depth, two courses must be taken in one area.

Communications and Signal Processing

EEE 407 Digital Signal Processing.....	4
EEE 455 Communication Systems	4
EEE 459 Communication Networks	3

Controls

EEE 480 Feedback Systems.....	4
EEE 482 Introduction to State Space Methods	3

Electromagnetics

EEE 440 Electromagnetic Engineering II	4
EEE 443 Antennas for Wireless Communications.....	3
EEE 445 Microwaves	4
EEE 448 Fiber Optics.....	4

Electronic Circuits
 EEE 405 Filter Design.....3
 EEE 425 Digital Systems and Circuits.....4
 EEE 433 Analog Integrated Circuits.....3

Power Systems
 EEE 460 Nuclear Concepts for the 21st Century.....3
 EEE 463 Electrical Power Plant.....3
 EEE 470 Electric Power Devices.....3
 EEE 471 Power System Analysis.....3
 EEE 473 Electrical Machinery.....3

Solid-State Electronics
 EEE 434 Quantum Mechanics for Engineers.....3
 EEE 435 Microelectronics.....3
 EEE 436 Fundamentals of Solid-State Devices.....3
 EEE 437 Optoelectronics.....3
 EEE 439 Semiconductor Facilities and Cleanroom Practices.....3

With Department of Electrical Engineering approval, Computer Science and Engineering courses at or above the 300 level may be substituted for one of the above areas.

**Electrical Engineering
 Program of Study
 Typical Four-Year Sequence**

First Year

First Semester
 CHM 114 General Chemistry for Engineers *SQ*.....4
 or CHM 116 General Chemistry *SQ* (4)
 ECE 100 Introduction to Engineering Design¹ *CS*.....4
 or EEE 120 Digital Design Fundamentals (3)
 ENG 101 First-Year Composition.....3
 MAT 270 Calculus with Analytic Geometry I *MA*.....4
 Total 14 or 15

Second Semester
 EEE 120 Digital Design Fundamentals¹.....3
 or ECE 100 Introduction to Engineering
 Design *CS* (4)
 ENG 102 First-Year Composition.....3
 MAT 271 Calculus with Analytic Geometry II *MA*.....4
 PHY 121 University Physics I: Mechanics *SQ*².....3
 PHY 122 University Physics Laboratory I *SQ*².....1
 Total 15 or 14

Second Year

First Semester
 CSE 100 Principles of Programming with C++ *CS*.....3
 ECN 111 Macroeconomic Principles *SB*.....3
 or ECN 112 Microeconomic Principles *SB* (3)
 MAT 272 Calculus with Analytic Geometry III *MA*.....4
 MAT 274 Elementary Differential Equations *MA*.....3
 PHY 131 University Physics II: Electricity and
 Magnetism *SQ*³.....3
 PHY 132 University Physics Laboratory II *SQ*³.....1
 Total 17

Second Semester
 ECE 201 Electrical Networks I.....4
 EEE 225 Assembly Language Programming and
 Microprocessors (Motorola).....4
 or EEE 226 Assembly Language Programming and
 Microprocessors (Intel)(4)
 MAT 362 Advanced Mathematics for Engineers and
 Scientists I.....3

PHY 241 University Physics III.....3
 HU/SB and awareness area course⁴.....3
 Total 17

Third Year

First Semester
 ECE 334 Electronic Devices and Instrumentation.....4
 EEE 302 Electrical Networks II.....3
 EEE 340 Electromagnetic Engineering I.....4
 MAT 342 Linear Algebra.....3
 HU/SB and awareness area course⁴.....3
 Total 17

Second Semester
 ECE 300 Intermediate Engineering Design *L*.....3
 ECE 352 Properties of Electronic Materials.....4
 EEE 303 Signals and Systems.....3
 EEE 360 Energy Conversion and Transport.....4
 HU/SB and awareness area course⁴.....3
 Total 17

Fourth Year

First Semester
 ECE 314 Engineering Mechanics.....4
 EEE 350 Random Signal Analysis.....3
 EEE 488 Senior Design Laboratory I.....2
 Technical electives.....7
 Total 16

Second Semester
 EEE 489 Senior Design Laboratory II.....2
 HU/SB and awareness area course⁴.....3
 Technical electives.....10
 Total 15

¹ Both ECE 100 and EEE 120 are required.
² Both PHY 121 and 122 must be taken to secure *SQ* credit.
³ Both PHY 131 and 132 must be taken to secure *SQ* credit.
⁴ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to satisfy HU or SB requirements.

ELECTRICAL ENGINEERING (EEE)

EEE 120 Digital Design Fundamentals. (3)
fall, spring, summer
 Number systems, conversion methods, binary and complement arithmetic, Boolean algebra, circuit minimization, ROMs, PLAs, flipflops, synchronous sequential circuits. Lecture, lab. Cross-listed as CSE 120. Credit is allowed for only CSE 120 or EEE 120. Prerequisite: computer literacy.
EEE 225 Assembly Language Programming and Microprocessors (Motorola). (4)
fall, spring, summer
 Assembly language programming, including input/output programming and exception/interrupt handling. Register-level computer organization, I/O interfaces, assemblers, and linkers. Motorola-based assignments. Lecture, lab. Cross-listed as CSE 225. Credit is allowed for only CSE 225 or EEE 225. Prerequisites: CSE 100 (or 110 or 200); CSE 120 or EEE 120.

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EEE 226 Assembly Language Programming and Microprocessors (Intel). (4)*fall and spring*

CPU/memory/peripheral device interfaces and programming. System buses, interrupts, serial and parallel I/O, DMA, coprocessors. Intel-based assignments. Lecture, lab. Cross-listed as CSE 226. Credit is allowed for only CSE 226 or EEE 226. Prerequisites: CSE 100 (or 110 or 200); CSE 120 or EEE 120.

EEE 302 Electrical Networks II. (3)*fall, spring, summer*

Analysis of linear and nonlinear networks. Analytical and numerical methods. Prerequisite: ECE 301. Pre- or corequisite: MAT 362.

EEE 303 Signals and Systems. (3)*fall, spring, summer*

Introduction to continuous and discrete time signal and system analysis, linear systems, Fourier, and z-transforms. Prerequisite: EEE 302. Pre- or corequisite: MAT 342.

EEE 340 Electromagnetic Engineering I. (4)*fall, spring, summer*

Static and time varying vector fields; boundary value problems; dielectric and magnetic materials; Maxwell's equations; boundary conditions. Prerequisites: MAT 362; PHY 131, 132.

EEE 350 Random Signal Analysis. (3)*fall and spring*

Probabilistic and statistical analysis as applied to electrical signals and systems. Pre- or corequisite: EEE 303 or MAE 317.

EEE 360 Energy Conversion and Transport. (4)*fall and spring*

Three-phase circuits. Energy supply systems. Magnetic circuit analysis, synchronous generators, transformers, induction and DC machines. Transmission line modeling and design. Lecture, lab. Prerequisite: EEE 302.

EEE 405 Filter Design. (3)*fall*

Principles of active and passive analog filter design, frequency domain approximations, sensitivity and synthesis of filters. Prerequisite: EEE 303.

EEE 407 Digital Signal Processing. (4)*fall*

Time and frequency domain analysis, difference equations, z-transform, FIR and IIR digital filter design, discrete Fourier transform, FFT, and random sequences. Lecture, lab. Prerequisites: EEE 303; MAT 342.

EEE 425 Digital Systems and Circuits. (4)*fall and spring*

Digital logic gate analysis and design. Propagation delay times, fan out, power dissipation, noise margins. Design of MOS and bipolar logic families, including NMOS, CMOS, standard and advanced TTL, ECL, and BiCMOS. Inverter, combinational and sequential logic circuit design, MOS memories, VLSI circuits. Computer simulations using PSPICE. Lecture, lab. Prerequisite: ECE 334.

EEE 433 Analog Integrated Circuits. (3)*spring*

Analysis, design, and applications of modern analog circuits using integrated bipolar and field effect transistor technologies. Prerequisite: ECE 334.

EEE 434 Quantum Mechanics for Engineers. (3)*fall*

Angular momentum, wave packets, Schroedinger wave equation, probability, problems in one dimension, principles of wave mechanics, scattering, tunneling, central forces, angular momentum, hydrogen atom, perturbation theory, variational techniques. Prerequisites: ECE 352; EEE 340.

EEE 435 Microelectronics. (3)*spring*

Practice of solid-state device fabrication techniques, including thin film and integrated circuit fabrication principles. Lecture, lab. Fee. Pre- or corequisite: EEE 436.

EEE 436 Fundamentals of Solid-State Devices. (3)*fall and spring*

Semiconductor fundamentals, pn junctions, metal-semiconductor contacts, metal-oxide-semiconductor capacitors and field-effect transistors, bipolar junction transistors. Prerequisite: ECE 352.

EEE 437 Optoelectronics. (3)*not regularly offered*

Basic operating principles of various types of optoelectronic devices which play important roles in commercial and communication electronics; light-emitting diodes, injection lasers, and photodetectors. Prerequisite: EEE 436.

EEE 439 Semiconductor Facilities and Cleanroom Practices. (3)*fall*

Microcontamination, controlled environments, cleanroom layout and systems, modeling, codes and legislation, ultrapure water, production materials, personnel and operations, hazard management, advanced concepts. Prerequisite: EEE 435 or instructor approval.

EEE 440 Electromagnetic Engineering II. (4)*fall and spring*

Second half of an introductory course in electromagnetic theory and its application in electrical engineering. Analytical and numerical solution of boundary value problems. Advanced transmission lines; waveguides; antennas; radiation and scattering. Lecture, lab. Prerequisite: EEE 340 (or its equivalent).

EEE 443 Antennas for Wireless Communications. (3)*spring*

Fundamental parameters; radiation integrals; wireless systems; wire, loop, and microstrip antennas; antenna arrays; smart antennas; ground effects; multipath. Prerequisite: EEE 340 (or its equivalent).

EEE 445 Microwaves. (4)*fall*

Waveguides; circuit theory for waveguiding systems; microwave devices, systems, and energy sources; striplines and microstrips; impedance matching transformers; measurements. Lecture, lab. Prerequisite: EEE 340 (or its equivalent).

EEE 448 Fiber Optics. (4)*fall*

Principles of fiber-optic communications. Lecture, lab. Prerequisites: EEE 303, 340.

EEE 455 Communication Systems. (4)*fall and spring*

Signal analysis techniques applied to the operation of electrical communication systems. Introduction to and overview of modern digital and analog communications. Lecture, lab. Prerequisite: EEE 350.

EEE 459 Communication Networks. (3)*spring*

Fundamentals of communication networks. Study of Seven-Layer OSI model. Focus on functionality and performance of protocols used in communication networks. Prerequisite: EEE 350.

EEE 460 Nuclear Concepts for the 21st Century. (3)*not regularly offered*

Radiation interactions, damage, dose, and instrumentation. Cosmic rays, satellite effects; soft errors; transmutation doping. Fission reactors, nuclear power. TMI, Chernobyl. Radioactive waste. Prerequisite: PHY 241 or 361.

EEE 463 Electrical Power Plant. (3)*fall*

Nuclear, fossil, and solar energy sources. Analysis and design of steam supply systems, electrical generating systems, and auxiliary systems. Power plant efficiency and operation. Prerequisites: ECE 301, 340 (or PHY 241).

EEE 470 Electric Power Devices. (3)*fall*

Analysis of devices used for short circuit protection, including circuit breakers, relays, and current and voltage transducers. Protection against switching and lightning over voltages. Insulation coordination. Prerequisite: EEE 360.

EEE 471 Power System Analysis. (3)*spring*

Review of transmission line parameter calculation. Zero sequence impedance, symmetrical components for fault analysis, short circuit calculation, review of power flow analysis, power system stability, and power system control concepts. Prerequisite: EEE 360.

EEE 473 Electrical Machinery. (3)*fall*

Operating principles, constructional details, and design aspects of conventional DC and AC machines, transformers and machines used in computer disc drives, printers, wrist watches, and automobiles. Prerequisite: EEE 360.

EEE 480 Feedback Systems. (4)*fall and spring*

Analysis and design of linear feedback systems. Frequency response and root locus techniques, series compensation, and state variable feedback. Lecture, lab. Prerequisite: EEE 303.

EEE 482 Introduction to State Space Methods. (3)*fall*

Discrete and continuous systems in state space form controllability, stability, and pole placement. Observability and observers. Pre- or corequisite: EEE 480.

EEE 488 Senior Design Laboratory I. (2)*fall and spring*

Capstone senior project. Design process: research, concept, feasibility, simulation, specifications, benchmarking, and proposal generation. Technical communications and team skills enrichment. Lecture, lab. Prerequisites: ECE 300, 334; EEE 303, 340; senior status. Pre- or corequisite: ECE 352; EEE 360.

EEE 489 Senior Design Laboratory II. (2)*fall and spring*

Capstone senior project. Implement, evaluate, and document EEE 488 design. Social, economic, and safety considerations. Technical communications and team skills enrichment. Lecture, lab. Prerequisite: EEE 488 in the immediately preceding semester.

EEE 490 Senior Design Laboratory. (3)*fall and spring*

Project-oriented laboratory. Each student must complete one or more design projects during the semester. Lecture, lab. Prerequisites: ECE 300, 334; EEE 303; senior status.

*General Studies: L***EEE 506 Digital Spectral Analysis. (3)***spring*

Principles and applications of digital spectral analysis, least squares, random sequences, parametric, and nonparametric methods for spectral estimation. Prerequisites: EEE 407, 554.

EEE 507 Multidimensional Signal Processing. (3)*fall*

Processing and representation of multidimensional signals. Design of systems for processing multidimensional data. Introduction to image and array processing issues. Prerequisite: EEE 407 or instructor approval.

EEE 508 Digital Image Processing and Compression. (3)*spring*

Fundamentals of digital image perception, representation, processing, and compression. Emphasis on image coding techniques. Signals include still pictures and motion video. Prerequisites: EEE 350 and 407 (or their equivalents).

EEE 511 Artificial Neural Computation Systems. (3)*fall*

Networks for computation, learning function representations from data, learning algorithms and analysis, function approximation and information representation by networks, applications in control systems and signal analysis. Prerequisite: instructor approval.

EEE 523 Advanced Analog Integrated Circuits. (3)*fall*

Analysis and design of analog integrated circuits: analog circuit blocks, reference circuits, operational-amplifier circuits, feedback, and nonlinear circuits. Prerequisite: EEE 433 (or its equivalent).

EEE 525 VLSI Design. (3)*fall and spring*

Analysis and design of Very Large Scale Integrated (VLSI) circuits. Physics of small devices, fabrication, regular structures, and system timing. Open only to graduate students.

EEE 526 VLSI Architectures. (3)*fall*

Special-purpose architectures for signal processing. Design of array processor systems at the system level and processor level. High-level synthesis. Prerequisite: CSE 330 or EEE 407 or instructor approval.

EEE 527 Analog to Digital Converters. (3)*fall*

Detailed introduction to the design of Nyquist rate, CMOS analog to digital converters. Prerequisite: EEE 523.

EEE 530 Advanced Silicon Processing. (3)*spring*

Thin films, CVD, oxidation, diffusion, ion-implantation for VLSI, metallization, silicides, advanced lithography, dry etching, rapid thermal processing. Pre- or corequisite: EEE 435.

EEE 531 Semiconductor Device Theory I. (3)*fall*

Transport and recombination theory, pn and Schottky barrier diodes, bipolar and junction field-effect transistors, and MOS capacitors and transistors. Prerequisite: EEE 436 (or its equivalent).

EEE 532 Semiconductor Device Theory II. (3)*spring*

Advanced MOSFETs, charge-coupled devices, solar cells, photodetectors, light-emitting diodes, microwave devices, and modulation-doped structures. Prerequisite: EEE 531.

EEE 533 Semiconductor Process/Device Simulation. (3)*fall*

Process simulation concepts, oxidation, ion implantation, diffusion, device simulation concepts, pn junctions, MOS devices, bipolar transistors. Prerequisite: EEE 436 (or its equivalent).

EEE 534 Semiconductor Transport. (3)*spring*

Carrier transport in semiconductors. Hall effect, high electric field, Boltzmann equation, correlation functions, and carrier-carrier interactions. Prerequisites: EEE 434, 436 (or 531).

EEE 536 Semiconductor Characterization. (3)*spring*

Measurement techniques for semiconductor materials and devices. Electrical, optical, physical, and chemical characterization methods. Prerequisite: EEE 436 (or its equivalent).

EEE 537 Semiconductor Optoelectronics I. (3)*fall*

Electronic states in semiconductors, quantum theory of radiation, absorption processes, radiative processes, nonradiative processes, photoluminescence, and photonic devices. Prerequisites: EEE 434, 436 (or 531).

EEE 538 Semiconductor Optoelectronics II. (3)*spring*

Material and device physics of semiconductor lasers, light-emitting diodes, and photodetectors. Emerging material and device technology in III-V semiconductors. Prerequisite: EEE 537.

EEE 539 Introduction to Solid-State Electronics. (3)*fall*

Crystal lattices, reciprocal lattices, quantum statistics, lattice dynamics, equilibrium, and nonequilibrium processes in semiconductors. Prerequisite: EEE 434.

EEE 541 Electromagnetic Fields and Guided Waves. (3)*not regularly offered*

Polarization and magnetization; dielectric, conducting, anisotropic, and semiconducting media; duality, uniqueness, and image theory; plane wave functions, waveguides, resonators, and surface guided waves. Prerequisite: EEE 440 (or its equivalent).

EEE 543 Antenna Analysis and Design. (3)*fall*

Impedances, broadband antennas, frequency independent antennas, miniaturization, aperture antennas, horns, reflectors, lens antennas, and continuous sources design techniques. Prerequisite: EEE 443 (or its equivalent).

EEE 544 High-Resolution Radar. (3)*not regularly offered*

Fundamentals; wideband coherent design, waveforms, and processing; stepped frequency; synthetic aperture radar (SAR); inverse synthetic aperture radar (ISAR); imaging. Prerequisites: EEE 303 and 340 (or their equivalents).

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EEE 545 Microwave Circuit Design. (3)*spring*

Analysis and design of microwave attenuators, in-phase and quadrature-phase power dividers, magic tee's, directional couplers, phase shifters, DC blocks, and equalizers. Prerequisite: EEE 445 or instructor approval.

EEE 546 Advanced Fiber Optics. (3)*not regularly offered*

Theory of propagation in fibers, couplers and connectors, distribution networks, modulation, noise and detection, system design, and fiber sensors. Prerequisite: EEE 448 or instructor approval.

EEE 547 Microwave Solid-State Circuit Design I. (3)*spring*

Application of semiconductor characteristics to practical design of microwave mixers, detectors, limiters, switches, attenuators, multipliers, phase shifters, and amplifiers. Prerequisite: EEE 545 or instructor approval.

EEE 548 Coherent Optics. (3)*not regularly offered*

Diffraction, lenses, optical processing, holography, electro-optics, and lasers. Prerequisite: EEE 440 (or its equivalent).

EEE 549 Lasers. (3)*not regularly offered*

Theory and design of gas, solid, and semiconductor lasers. Prerequisite: EEE 448 or instructor approval.

EEE 550 Transform Theory and Applications. (3)*not regularly offered*

Introduction to abstract integration, function spaces, and complex analysis in the context of integral transform theory. Applications to signal analysis, communication theory, and system theory. Prerequisite: EEE 303.

EEE 551 Information Theory. (3)*not regularly offered*

Entropy and mutual information, source and channel coding theorems, applications for communication and signal processing. Prerequisite: EEE 554.

EEE 552 Digital Communications. (3)*spring*

Complex signal theory, digital modulation, optimal coherent and incoherent receivers, channel codes, coded modulation, Viterbi algorithm. Prerequisite: EEE 554.

EEE 553 Coding and Cryptography. (3)*spring*

Introduction to algebra, block and convolutional codes, decoding algorithms, turbo codes, coded modulation, private and public key cryptography. Prerequisite: EEE 554.

EEE 554 Random Signal Theory. (3)*fall*

Application of statistical techniques to the representation and analysis of electrical signals and to communications systems analysis. Prerequisite: EEE 350 or instructor approval.

EEE 555 Modeling and Performance Analysis. (3)*not regularly offered*

Modeling and performance analysis of stochastic systems and processes such as network traffic queueing systems and communication channels. Prerequisite: EEE 554.

EEE 556 Detection and Estimation Theory. (3)*spring*

Combination of the classical techniques of statistical inference and the random process characterization of communication, radar, and other modern data processing systems. Prerequisites: EEE 455, 554.

EEE 558 Wireless Communications. (3)*fall*

Cellular systems, path loss, multipath fading channels, modulation and signaling for wireless, diversity, equalization coding, spread spectrum, TDMA/FDMA/CDMA. Prerequisite: EEE 552.

EEE 571 Power System Transients. (3)*not regularly offered*

Simple switching transients. Transient analysis by deduction. Damping of transients. Capacitor and reactor switching. Transient recovery voltage. Travelling waves on transmission lines. Lightning. Protection of equipment against transient overvoltages. Introduction to computer analysis of transients. Prerequisite: EEE 471.

EEE 572 Advanced Power Electronics. (3)*not regularly offered*

Analysis of device operation, including thyristors, gate-turn-off thyristors, and transistors. Design of rectifier and inverter circuits. Applications such as variable speed drives, HVDC, motor control, and uninterruptable power supplies. Prerequisite: EEE 470.

EEE 573 Electric Power Quality. (3)*spring*

Sinusoidal waveshape maintenance; study of momentary events, power system harmonics, instrumentation, filters, power conditioners, and other power quality enhancement methods. Prerequisite: EEE 360 (or its equivalent).

EEE 574 Computer Solution of Power Systems. (3)*not regularly offered*

Algorithms for digital computation for power flow, fault, and stability analysis. Sparse matrix and vector programming methods, numerical integration techniques, stochastic methods, solution of the least squares problem. Prerequisite: EEE 471.

EEE 577 Power Engineering Operations and Planning. (3)*fall*

Economic dispatch, unit commitment, dynamic programming, power system planning and operation, control, generation modeling, AGC, and power production. Prerequisite: EEE 471 or graduate standing.

EEE 579 Power Transmission and Distribution. (3)*spring*

High-voltage transmission line electric design; conductors, corona, RI and TV noise, insulators, clearances. DC characteristic, feeders voltage drop, and capacitors. Prerequisite: EEE 470.

EEE 581 Filtering of Stochastic Processes. (3)*not regularly offered*

Modeling, estimation, and filtering of stochastic processes, with emphasis on the Kalman filter and its applications in signal processing and control. Prerequisites: EEE 482, 550, 554.

EEE 582 Linear System Theory. (3)*spring*

Controllability, observability, and realization theory for multivariable continuous time systems. Stabilization and asymptotic state estimation. Disturbance decoupling, noninteracting control. Prerequisite: EEE 482.

EEE 584 Internship. (3)*fall, spring, summer*

Work performed in an industrial setting that provides practical experience and adds value to the classroom and research learning processes.

EEE 585 Digital Control Systems. (3)*fall*

Analysis and design of digital and sampled data control systems, including sampling theory, z-transforms, the state transition method, stability, design, and synthesis. Prerequisites: EEE 482, 550.

EEE 586 Nonlinear Control Systems. (3)*not regularly offered*

Stability theory, including phase-plane, describing function, Liapunov's method, and frequency domain criteria for continuous and discrete, nonlinear, and time-varying systems. Prerequisite: EEE 482.

EEE 587 Optimal Control. (3)*fall*

Optimal control of systems. Calculus of variations, dynamic programming, linear quadratic regulator, numerical methods, and Pontryagin's principle. Cross-listed as MAE 507. Credit is allowed for only EEE 587 or MAE 507. Prerequisite: EEE 482 or MAE 506.

EEE 588 Design of Multivariable Control Systems. (3)*spring*

Practical tools for designing robust MIMO controllers. State feedback and estimation, model-based compensators, MIMO design methodologies, CAD, real-world applications. Prerequisite: EEE 480 (or its equivalent).

EEE 606 Adaptive Signal Processing. (3)*fall*

Principles/applications of adaptive signal processing, adaptive linear combiner, Wiener least-squares solution, gradient search, performance surfaces, LMS/RLS algorithms, block time/frequency domain LMS. Prerequisites: EEE 506, 554.

EEE 607 Speech Coding for Multimedia Communications. (3)*spring*

Speech and audio coding algorithms for applications in wireless communications and multimedia computing. Prerequisite: EEE 407. Pre- or corequisite: EEE 506.

EEE 631 Heterojunctions and Superlattices. (3)*fall*

Principles of heterojunctions and quantum well structures, band line-ups, optical, and electrical properties. Introduction to heterojunction devices. Prerequisites: EEE 436, 531.

EEE 632 Heterojunction Devices. (3)*not regularly offered*

Applications of heterostructures, quantum wells, and superlattice to modulation-doped FETs, heterostructure bipolar transistors, lasers, detectors, and modulators. Prerequisites: EEE 434, 631 (or 537).

EEE 641 Advanced Electromagnetic Field Theory. (3)*not regularly offered*

Cylindrical wave functions, waveguides, and resonators; spherical wave functions and resonators; scattering from planar, cylindrical, and spherical surfaces; Green's functions. Prerequisite: EEE 541 (or its equivalent).

EEE 643 Advanced Topics in Electromagnetic Radiation. (3)*spring*

High-frequency asymptotic techniques, geometrical and physical theories of diffraction (GTD and PTD), moment method (MM), radar cross section (RCS) prediction, Fourier transforms in radiation, and synthesis methods. Prerequisite: EEE 543.

EEE 647 Microwave Solid-State Circuit Design II. (3)*fall*

Practical design of microwave free-running and voltage-controlled oscillators using Gunn and Impatt diodes and transistors; analysis of noise characteristics of the oscillator. Prerequisites: EEE 545, 547.

EEE 684 Internship. (1–2)*fall, spring, summer*

Work performed in an industrial setting that provides practical experience and adds value to the classroom and research learning processes.

EEE 686 Adaptive Control. (3)*not regularly offered*

Main topics covered: adaptive identification, convergence, parametric models, performance and robustness properties of adaptive controllers, persistence of excitation, and stability. Prerequisites: both EEE 582 and 586 or only instructor approval.

EEE 731 Advanced MOS Devices. (3)*spring*

Threshold voltage, subthreshold current, scaling, small geometry effects, hot electrons, and alternative structures. Prerequisite: EEE 531.

EEE 770 Advanced Topics in Power Systems. (3)*not regularly offered*

Power system problems of current interest, approached at an advanced technical level, for mature students. Prerequisites: EEE 577 and 579 (or their equivalents); instructor approval.

EEE 784 Internship. (3)*fall, spring, summer*

Work performed in an industrial setting that provides practical experience and adds value to the classroom and research learning processes.

Department of Industrial Engineering

Gary L. Hogg

Chair

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PROFESSORS

COCHRAN, DOOLEY, HENDERSON, HOGG, HUBELE,
MONTGOMERY, RUNGER, WOLFE

ASSOCIATE PROFESSORS

ANDERSON-ROWLAND, FOWLER, MACKULAK, MOOR,
MOU, ROBERTS, SHUNK, VILLALOBOS, YE

ASSISTANT PROFESSORS

CARLYLE, SENTURK

The industrial engineer (IE) provides leadership for American organizations in reestablishing competitiveness in the global marketplace through system integration and productivity improvement. No challenge can be greater than improving productivity, which is the application of knowledge and skills to provide improved goods and services to enhance the quality of life, both on and off the job. This improvement must be achieved without waste of physical and human resources while maintaining environmental balance. Industrial engineers are the “productivity people” who provide the necessary leadership and skills to integrate technology. This gives IEs a wide range of interests and responsibilities.

As in other engineering fields, industrial engineering is concerned with solving problems through the application of scientific and practical knowledge. What sets industrial engineering apart from other engineering disciplines is its broader scope. An IE relates to the total picture of productivity. An IE looks at the “big picture” of what makes society perform best—the right combination of human resources, natural resources, synthetic structures, and equipment. An IE bridges the gap between management and operations, dealing with and motivating people as well as determining what tools should be used and how they should be used.

An IE deals with people as well as things. In fact, industrial engineering is often called the “people-oriented profession.” It is a primary function of the IE to integrate people and technology-oriented systems. Therefore, IEs are active in the fields of ergonomics and human factors.

To be competitive in this global economy, it is essential to emphasize and continually improve the quality of goods and services. Industrial engineering is the only engineering discipline offering course work in designing and implementing quality assurance systems.

The IE’s skills are applicable to every kind of organization. IEs learn how to approach, think about, and solve productivity and integration problems regardless of their settings. IEs work in manufacturing facilities, banks, hospitals,

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government, transportation, construction, and social services. Within this wide variety of organizations, IEs get involved in projects such as designing and implementing quality control systems, independent work groups, the work flow in a medical laboratory, real-time production control systems, computer-based management information systems, and manufacturing operating systems, to name a few. A unique feature of most industrial engineering assignments is that they involve interdisciplinary teams. For example, the IE might be the leader of a team consisting of electrical and mechanical engineers, accountants, computer scientists, and planners. This IE program gives the student the skills necessary to direct these teams. These skills include team building, brainstorming, group dynamics, and interpersonal relationships.

IEs have a sound background in technology integration, management theory and application, engineering economics and cost analysis. IEs are well equipped to deal with problems never seen before, making them prime candidates for promotion through the management career path, especially in high-tech organizations. In fact, more than half of all practicing IEs are in management positions. This area of expertise has placed the IE in the leadership role in the establishment of a new field of activity called “management of technology.”

Industrial engineers are well trained in the development and use of analytical tools, and their most distinctive skill is in the area of model building. IEs must quickly learn and understand the problems of their clients. In this context, good people skills and good analytic skills are essential. This industrial engineering program offers both.

INDUSTRIAL ENGINEERING—B.S.E.

The curriculum in Industrial Engineering builds upon mathematics, computer programming, and the engineering core. Beyond this foundation, the curriculum includes a number of required IE core courses, IE electives, and study area electives, enabling students to focus on a specific career objective.

By successfully completing this curriculum, the student is prepared to embark on a career in industrial engineering or to pursue advanced education in graduate school.

The career-focused study-areas are as follows:

1. *Industrial and Management Systems.* For a broad traditional IE career in the design and analysis of manufacturing and service systems.
2. *Information and Telecommunication Systems.* For a career in the application of integrated computer and telecommunication systems to manufacturing and service systems analysis and design.
3. *Global Industrial Engineering Leadership.* For a career in global manufacturing and service organizations.
4. *High-Tech Manufacturing.* For a career in the design and analysis of integrated manufacturing systems.
5. *Preprofessional and Service Systems.* For a career in law, medicine or public service or careers in the design and analysis of health care, agribusiness, banking/financial, and government/public-administration systems.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is necessary for the B.S.E. degree in Industrial Engineering. A minimum of 50 upper-division hours is required. Students must attain a GPA of at least 2.00 for the courses in the major field.

GRADUATION REQUIREMENTS

In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See “University Graduation Requirements,” page 74. For information concerning admission, degree, course, and graduation requirements for the School of Engineering, see pages 211–214 of this catalog.

COURSE REQUIREMENTS

Students take 60 semester hours of university English proficiency and general studies course work, 20 hours of engineering core, 30 hours of industrial engineering courses, six hours of industrial engineering electives, and 12 hours of career-focused study area electives. Each study area has an associated list of recommended General Studies, IE electives, and study area courses. The course work for the undergraduate degree can be classified into the following categories:

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
————— <i>or</i> —————	
ENG 105 Advanced First-Year Composition (3)	
Elective chosen with an advisor (3)	
————— <i>or</i> —————	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

<i>Humanities and Fine Arts/Social and Behavioral Sciences</i>	
ECN 112 Microeconomic Principles <i>SB</i>	3
HU courses.....	6–9
SB course(s).....	3–6
Minimum total	15
<i>Literacy and Critical Inquiry</i>	
ECE 300 Intermediate Engineering Design <i>L</i>	3
Approved IE L course	3
Total	6
<i>Natural Sciences/Basic Sciences</i>	
CHM 114 General Chemistry for Engineers <i>SQ</i>	4
or CHM 116 General Chemistry <i>SQ</i> (4)	
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
Basic science elective.....	3
Total	15
<i>Mathematical Studies</i>	
MAT 242 Elementary Linear Algebra.....	2
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4

MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	17
General Studies/school requirements total.....	53

Engineering Core

ECE 100 Introduction to Engineering Design <i>CS</i>	4
ECE 201 Electrical Networks I.....	4
ECE 210 Engineering Mechanics I: Statics.....	3
ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 350 Structure and Properties of Materials.....	3
IEE 463 Computer-Aided Manufacturing and Control <i>CS</i>	3
Total	20

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

Industrial Engineering Major

The following courses are required:

ASE 485 Engineering Statistics <i>CS</i>	3
CSE 100 Principles of Programming with C++ <i>CS</i>	3
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
IEE 294 ST: Industrial Engineering Applications Seminar.....	2
IEE 300 Economic Analysis for Engineers.....	3
IEE 360 Manufacturing Processes.....	3
IEE 368 Facilities Analysis and Design.....	3
IEE 374 Quality Control <i>CS</i>	3
IEE 461 Production Control.....	3
IEE 475 Simulating Stochastic Systems <i>CS</i>	3
IEE 476 Operations Research Techniques/Applications <i>CS</i>	4
Total	33

Industrial Engineering Electives Area

Students select four semester hours of industrial engineering electives. IEE 361 Manufacturing Processes Lab is highly recommended. For course information, see the list of recommended courses in the department advising office.

Career-Focused Study Area Electives

Students select a minimum of 12 semester hours from the following recommended electives in one of the five career-focused study areas:

Industrial and Management Systems

IEE 305 Information Systems Engineering <i>CS</i>	3
IEE 431 Engineering Administration.....	3
Any approved engineering or business electives.....	6

Information and Telecommunication Systems

CSE 200 Concepts of Computer Science <i>CS</i>	3
CSE 210 Object-Oriented Design and Data Structure.....	3
CSE 240 Introduction to Programming Languages.....	3
IEE 305 Information Systems Engineering <i>CS</i>	3

Global Industrial Engineering Leadership

ECN 306 Survey of International Economics <i>SB, G</i>	3
IBS 300 Principles of International Business <i>G</i>	3
IBS 400 Cultural Factors in International Business <i>C, G</i>	3
Any approved international business electives.....	3

High-Tech Manufacturing

ECE 352 Properties of Electronic Materials.....	4
EEE 435 Microelectronics.....	3
EEE 436 Fundamentals of Solid-State Devices.....	3
MSE 335 Introduction to Materials Science and Engineering.....	3

MSE 441 Analysis of Materials Failures.....	3
MSE 470 Polymers and Composites.....	3

Preprofessional and Service Systems*Agribusiness Systems*

AGB 340 Food Processing.....	3
AGB 341 Food Analysis.....	3
AGB 351 Management Science <i>CS</i>	3
AGB 364 Agribusiness Technologies I.....	3
AGB 414 Agribusiness Analysis <i>L</i>	3
AGB 440 Food Safety.....	3
AGB 442 Food and Industrial Microbiology.....	4

Banking and Financial Systems

FIN 300 Fundamentals of Finance.....	3
FIN 331 Financial Markets and Institutions.....	3
FIN 361 Managerial Finance.....	3
FIN 431 Management of Financial Institutions.....	3

Government and Public Administration Systems

POS 310 American National Government <i>SB</i>	3
POS 316 State and Local Government <i>SB</i>	3
POS 320 Public Administration <i>SB</i>	3
POS 333 Interest Groups <i>SB</i>	3

Health Care Systems

HSA 473 Comparative Health Systems.....	3
HSA 498 PS: Health Care Finance.....	3
HSA 498 PS: Health Economics.....	3
HSA 498 PS: Health Service Administration and Policy.....	3
HSA 498 PS: Policy Issues in Health Care.....	3

Prelaw Systems

AGB 456 World Agricultural Resources <i>G</i>	3
AJS 360 Substantive Criminal Law (ASU West).....	3
COM 422 Advanced Argumentation.....	3
GLB 300 Gateway to Global Business (ASU West).....	3
LES 306 Business Law.....	3
POL 470 Law and Political Order (ASU West).....	3

Premedicine Systems

BIO 181 General Biology <i>SQ</i>	4
BIO 182 General Biology <i>SG</i>	4
BIO 351 Developmental Anatomy.....	3
CHM 331 General Organic Chemistry.....	3
CHM 332 General Organic Chemistry.....	3
CHM 335 General Organic Chemistry Lab.....	1
CHM 336 General Organic Chemistry Lab.....	1

**Industrial Engineering
Program of Study
Typical Four-Year Sequence**

First Year**First Semester**

CHM 114 General Chemistry for Engineers <i>SQ</i>	4
or CHM 116 General Chemistry <i>SQ</i> ¹	
ECE 100 Introduction to Engineering Design <i>CS</i>	4
or HU/SB elective (3) ²	
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total	15

Second Semester

ECN 112 Microeconomic Principles <i>SB</i>	3
ENG 102 First-Year Composition.....	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ³	3
PHY 122 University Physics Laboratory I <i>SQ</i> ³	1

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HU/SB elective ²	3
or ECE 100 Introduction to Engineering Design CS (4)	—
Total	17

Second Year

First Semester

CSE 100 Principles of Programming with C++ CS	3
IEE 300 Economic Analysis for Engineers	3
MAT 242 Elementary Linear Algebra	2
MAT 272 Calculus with Analytic Geometry III MA	4
PHY 131 University Physics II: Electricity and Magnetism SQ ⁴	3
PHY 132 University Physics Laboratory II SQ ⁴	1
Total	16

Second Semester

ECE 210 Engineering Mechanics I: Statics	3
ECE 380 Probability and Statistics for Engineering Problem Solving CS	3
IEE 294 ST: Industrial Engineering Applications Seminar	2
IEE 360 Manufacturing Processes	3
MAT 274 Elementary Differential Equations MA	3
Basic science elective ⁵	3
Total	17

Third Year

First Semester

ASE 485 Engineering Statistics CS	3
IEE 368 Facilities Analysis and Design	3
IEE 374 Quality Control CS	3
HU/SB elective ²	3
Industrial Engineering elective	4
Total	16

Second Semester

ECE 300 Intermediate Engineering Design L	3
ECE 212 Engineering Mechanics II: Dynamics	3
ECE 350 Structure and Properties of Materials	3
IEE 463 Computer-Aided Manufacturing and Control CS	3
IEE 476 Operations Research Techniques/Applications CS	4
Total	16

Fourth Year

First Semester

ECE 201 Electrical Networks I	4
IEE 461 Production Control	3
IEE 475 Simulating Stochastic Systems CS	3
HU/SB elective ²	3
Study area elective	3
Total	16

Second Semester

HU/SB elective ²	3
Senior capstone course	3
Study area electives	9
Total	15

¹ Students who have taken no high school chemistry should take CHM 113 and 116.

² Engineering students may not use aerospace studies (AES) or military science (MIS) courses to satisfy HU or SB requirements.

³ Both PHY 121 and 122 must be taken to secure SQ credit.

⁴ Both PHY 131 and 132 must be taken to secure SQ credit.

⁵ This elective must be an earth science or life science course; if physics or chemistry, the course must be of a more advanced level than CHM 114 or 116 or PHY 131.

INDUSTRIAL ENGINEERING (IEE)

IEE 294 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Industrial Engineering Applications Seminar. (2)

IEE 300 Economic Analysis for Engineers. (3)

fall and spring

Economic evaluation of alternatives for engineering decisions, emphasizing the time value of money. Prerequisites: ECE 100; MAT 270.

IEE 305 Information Systems Engineering. (3)

fall

Emphasis on systems analysis, design and implementation of information systems using fourth-generation languages and alternative database structures. Prerequisite: CSE 100.

General Studies: CS

IEE 360 Manufacturing Processes. (3)

fall and spring

Production technique and equipment. Casting and molding, forming, machining, joining and assembly, computer-integrated manufacturing, rapid prototyping, and electronics manufacturing. Cross-listed as MAE 351. Credit is allowed for only IEE 360 or MAE 351. Prerequisite: ECE 350.

IEE 361 Manufacturing Processes Lab. (1)

fall and spring

Series of labs designed to illustrate concepts presented in IEE 360 on production technique and equipment. Corequisite: IEE 360 or MAE 351.

IEE 368 Facilities Analysis and Design. (3)

fall

Planning analysis and design of methods of the tangible physical assets of the firm. Emphasis on facilities location, materials handling, automation, computer integration, and utilization of financial resources. Applications in diverse fields. Lecture, lab. Prerequisite: IEE 300.

IEE 369 Work Analysis and Design. (3)

spring

Planning analysis and design of methods of accomplishing work. Emphasis on human factors, work planning, methods analysis and design, and work measurement. Applications in diverse fields. Lecture, lab.

IEE 374 Quality Control. (3)

fall

Control charting and other statistical process control techniques. Organization and managerial aspects of quality assurance, plus acceptance sampling plans. Prerequisite: ECE 380.

General Studies: CS

IEE 431 Engineering Administration. (3)

fall

Introduces quantitative and qualitative approaches to management functions, engineering administration, organizational analysis, decision making, and communication. Credit is allowed for only IEE 431 or 541. Prerequisite: senior standing.

IEE 437 Human Factors Engineering. (3)

fall

Study of the human psychological and physiological factors that underlie the design of equipment and the interaction between people and machines. Credit is allowed for only IEE 437 or 547.

IEE 461 Production Control. (3)

fall

Techniques for the planning, control, and evaluation of production systems. Project management, forecasting, inventory control, scheduling, enterprise requirements planning. Prerequisites: ASE 485; CSE 100; IEE 476.

IEE 463 Computer-Aided Manufacturing and Control. (3)

spring

Computer control in manufacturing, CIM, NC, logic controllers, group technology, process planning, and robotics. Credit is allowed for only IEE 463 or 543. Prerequisite: IEE 360 or MAE 351.

General Studies: CS

IEE 475 Simulating Stochastic Systems. (3)

fall and spring

Analysis of stochastic systems using basic queuing networks and discrete event simulation. Basic network modeling, shared resources, routing, assembly logic. Credit is allowed for only IEE 475 or 545. Prerequisites: ASE 485; CSE 100; IEE 476.

General Studies: CS

IEE 476 Operations Research Techniques/Applications. (4)*fall and spring*

Industrial systems applications with operations research techniques. Resource allocation, product mix, production, shipping, task assignment, market share, machine repair, customer service. Credit is allowed for only IEE 476 or 546. Prerequisites: ASE 485; CSE 100. *General Studies: CS*

IEE 490 Project in Design and Development. (3)*fall and spring*

Individual or team capstone project in creative design and synthesis. Prerequisite: senior standing.

IEE 494 Special Topics. (1–4)*not regularly offered***IEE 505 Applications Engineering. (3)***fall and spring*

Develops working knowledge of application systems development tools needed for computer-integrated enterprise. Includes techniques for application generation in fourth- and fifth-generation software environments. Topics include client server network systems, decision support systems, and transaction systems in distributed environment. Prerequisite: graduate standing.

IEE 511 Analysis of Decision Processes. (3)*spring*

Methods of making decisions in complex environments and statistical decision theory; effects of risk, uncertainty, and strategy on engineering and managerial decisions. Prerequisite: ECE 380.

IEE 520 Ergonomics Design. (3)*spring*

Human physiological and psychological factors in the design of work environments and in the employment of people in man-machine systems. Open-shop lab assignments in addition to class work. Prerequisite: IEE 437.

IEE 530 Enterprise Modeling. (3)*spring*

Focuses on social, economic, and technical models of the enterprise with emphasis on the management of technological resources. Includes organization, econometric, financial, and large-scale mathematical models. Prerequisite: graduate standing.

IEE 531 Topics in Engineering Administration. (3)*spring in even years*

Consideration given to philosophical, psychological, political, and social implications of administrative decisions. Prerequisite: IEE 532 or instructor approval. Prerequisite: graduate standing.

IEE 532 Management of Technology. (3)*spring*

Topics include designing a technical strategy; technological forecasting; interfacing marketing engineering and manufacturing; designing and managing innovation systems; creativity; application of basic management principles to technology management. Prerequisite: IEE 431.

IEE 533 Scheduling and Network Analysis Models. (3)*spring*

Application of scheduling and sequencing algorithms, deterministic and stochastic network analysis, and flow algorithms. Prerequisites: ECE 380; IEE 476.

IEE 541 Engineering Administration. (3)*fall*

Introduces quantitative and qualitative approaches to management functions, engineering administration, organizational analysis, decision making, and communication. Credit is allowed for only IEE 541 or 431. Prerequisite: graduate standing.

IEE 543 Computer-Aided Manufacturing and Control. (3)*spring*

Computer control in manufacturing, CIM, NC, logic controllers, group technology, process planning and robotics. Credit is allowed for only IEE 543 or 463. Prerequisite: C programming capability.

IEE 545 Simulating Stochastic Systems. (3)*fall and spring*

Analysis of stochastic systems using basic queuing networks and discrete event simulation. Basic network modeling, shared resources, routing, assembly logic. Credit is allowed for only IEE 545 or 475. Prerequisites: ASE 485; IEE 476.

IEE 546 Operations Research Techniques/Applications. (4)*fall and spring*

Students model and analyze industrial systems applications with operations research techniques. Resource allocation, product mix, production, shipping, task assignment, market share, machine repair, customer service. Credit is allowed for only IEE 546 or 476. Prerequisite: ASE 485.

IEE 547 Human Factors Engineering. (3)*fall and spring*

Study of people at work; designing for human performance effectiveness and productivity. Considerations of human physiological and psychological factors. Credit is allowed for only IEE 547 or 437. Prerequisite: graduate standing.

IEE 552 Strategic Technological Planning. (3)*spring*

Study of concept of strategy, strategy formulation process, and strategic planning methodologies with emphasis on engineering design and manufacturing strategy, complemented with case studies. An analytical executive planning decision support system is presented and used throughout course. Pre- or corequisites: IEE 545, 561, 572, 574.

IEE 560 Object-Oriented Information Systems. (3)*spring*

Application of object-oriented technology concepts to manufacturing and enterprise systems. Topics include Java, object management systems, and application design. Prerequisite: IEE 505.

IEE 561 Production Systems. (3)*spring*

Understanding how factories operate, how performance is measured, and how operational changes impact performance metrics. Operational philosophies, increasing production efficiency through quantitative methods. Prerequisites: ASE 485; IEE 476.

IEE 562 Computer-Aided Manufacturing (CAM) Tools. (3)*spring*

Current topics in automation, distributed control, control code generation, control logic validation, CAM integration, CAD/CAM data structures, planning for control systems. Topics vary by semester. Prerequisite: IEE 463 or 543.

IEE 563 Systems Analysis for Distributed Systems. (3)*spring*

Analysis and design of distributed groupware applications for manufacturing and enterprise systems. Prerequisite: graduate standing.

IEE 564 Planning for Computer-Integrated Manufacturing. (3)*fall*

Theory and use of IDEF methodology in planning for flexible manufacturing, robotics, and real-time control. Simulation concepts applied to computer-integrated manufacturing planning. Prerequisite: graduate standing.

IEE 565 Computer-Integrated Manufacturing Research. (3)*spring*

Determination and evaluation of research areas in computer-integrated manufacturing, including real-time software, manufacturing information systems, flexible and integrated manufacturing systems, robotics, and computer graphics. Prerequisite: IEE 564.

IEE 566 Simulation in Manufacturing. (3)*spring in even years*

Use of simulation in computer-integrated manufacturing with an emphasis on modeling material handling systems. Programming, declarative, and intelligence-based simulation environments. Prerequisite: IEE 545.

IEE 567 Simulation System Analysis. (3)*fall*

Simulation modeling of processes involving discrete and continuous system components. Topics include random number generators, output analysis, variance reduction, and statistical issues related to simulation. Prerequisite: IEE 545.

IEE 569 Advanced Statistical Methods. (3)*fall in even years*

Application of statistical inference procedures, based on ranks, to engineering problems. Efficient alternatives to classical statistical inference constrained by normality assumptions. Prerequisite: ASE 485.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

IEE 570 Advanced Quality Control. (3)*spring*

Economic-based acceptance sampling, multiattribute acceptance sampling, narrow limit gauging in inspector error and attributes acceptance sampling, principles of quality management, and selected topics from current literature. Prerequisite: ASE 485.

IEE 571 Quality Management. (3)*fall*

Total quality concepts, quality strategies, quality and competitive position, quality costs, vendor relations, the quality manual, and quality in the services. Prerequisite: graduate standing.

IEE 572 Design of Engineering Experiments. (3)*fall and spring*

Analysis of variance and experimental design. Topics include general design methodology, incomplete blocks, confounding, fractional replication, and response surface methodology. Prerequisite: ASE 485.

IEE 573 Reliability Engineering. (3)*spring*

Nature of reliability, time to failure densities, series/parallel/standby systems, complex system reliability, Bayesian reliability, and sequential reliability tests. Prerequisite: ECE 380.

IEE 574 Applied Deterministic Operations Research Models. (3)*fall and spring*

Develops advanced techniques in operations research for the solution of complex industrial systems problems. Goal programming, integer programming, heuristic methods, dynamic and nonlinear programming. Prerequisite: IEE 476.

IEE 575 Applied Stochastic Operations Research Models. (3)*spring*

Students formulate and solve industrial systems problems with stochastic components using analytical techniques. Convolution, continuous-time Markov chains, queues with batching, priorities, balking, open/closed queuing networks. Prerequisites: ASE 485; IEE 476.

IEE 577 Decision and Expert Systems Methodologies. (3)*fall*

Application of artificial intelligence methodologies in decision support systems. Topics include neural networks, fuzzy logic systems, and expert systems. Prerequisite: graduate standing.

IEE 578 Regression Analysis. (3)*fall*

Regression model building oriented toward engineers/physical scientists. Topics include linear regression, diagnostics biased and robust fitting, nonlinear regression. Prerequisite: ASE 485.

IEE 579 Time Series Analysis and Forecasting. (3)*fall in odd years*

Forecasting time series by the Box-Jenkins and exponential smoothing techniques; utilizes existing digital computer programs to augment the theory. Prerequisite: ASE 485.

IEE 582 Response Surfaces and Process Optimization. (3)*spring*

Introduction to response surface method and its applications. Topics include steepest ascent, canonical analysis, designs, and optimality criteria. Prerequisite: IEE 572.

IEE 594 Conference and Workshop. (1)*fall and spring*

Orientation to the developing work in the field with an emphasis on what the IE faculty are doing.

IEE 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Advanced Topics in Deterministic Operations Research. (3)
- (b) Advanced Topics in Scheduling. (3)
- (c) Analysis of Massive Data Sets. (3)
- (d) Computer and Human Vision. (3)
- (e) DOE/SPC for Semiconductor Processes. (3)
- (f) Enterprise Internet/Intranet. (3)
- (g) Introduction to Rapid Prototyping. (3)
- (h) Mechatronics. (3)
- (i) Modeling and Analysis of Semiconductor Manufacturing. (3)
- (j) Product Modeling. (3)
- (k) Strategic Design of Manufacturing Systems. (3)
- (l) Strategic Issues in Manufacturing. (3)

IEE 672 Advanced Topics in Experimental Design. (3)*spring in even years*

Engineering applications of factorial and fractional factorial designs with randomization restrictions, analysis techniques in parameter comparison, missing data, unbalanced designs. Prerequisite: IEE 572.

IEE 677 Regression and Linear Models. (3)*spring in odd years*

General linear models, applications, theory, including least squares, maximum likelihood estimation, properties of estimators, likelihood ratio tests, and computational procedures. Prerequisite: IEE 578.

IEE 679 Time Series Analysis and Control. (3)*fall in even years*

Identification, estimation, diagnostic checking techniques for ARIMA models, transfer functions, multiple time series models for feedback and feedforward control schemes. Prerequisite: IEE 579.

IEE 681 Reliability, Availability, and Serviceability. (3)*fall in even years*

Organizing hardware and software, integrity and fault-tolerant design, maintenance design and strategy, Markov models, fault-free analysis, and military standards. Prerequisite: IEE 573.

Department of Mechanical and Aerospace Engineering

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PROFESSORS

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SIERADZKI, TSENG, WIE, YAO

ASSOCIATE PROFESSORS

CHEN, KOURIS, KUO, LEE, PHELAN, RANKIN,
SQUIRES, WELLS

ASSISTANT PROFESSORS

CHAPSKY, FUSSELL, McNEILL, PERALTA, SUGAR

The Department of Mechanical and Aerospace Engineering is the administrative home for two undergraduate majors: Aerospace Engineering and Mechanical Engineering. Consistent with the department's mission to provide the best possible education to its students, a department goal is to attract and retain—from the metropolitan community, the state, and the country—outstanding and diverse students and to give each the opportunity to become competent in contemporary subjects that bear on an engineering career. This goal is achieved through a curriculum designed to accomplish the following four objectives:

1. *Technical Competency.* Graduates are able to model and predict the behavior of engineering systems by applying the fundamental principles from mathematics, physics, and chemistry and by using modern computational and experimental tools.
2. *Product Realization Ability.* Graduates are able to design components or systems at the conceptual and embodiment design level including the issues of production, manufacturability, and cost.

3. *Communication Skills.* Graduates can present and document effectively, using both oral and written communication, their work and ideas to a diverse audience.
4. *Professionalism.* Graduates are prepared for modern engineering practice by working in teams, keeping technologically abreast, and having an understanding of related ethical, environmental, and societal issues.

The Aerospace Engineering major provides students an education in technological areas critical to the design and development of aerospace vehicles and systems. Aerospace Engineering graduates are typically employed in aerospace industries or at government laboratories (e.g., NASA). The Mechanical Engineering major is perhaps one of the most broadly applicable programs in engineering, providing education for a wide variety of employment opportunities.

The two majors can serve as entry points to immediate professional employment or to graduate study. The emphasis in all fields is on the development of fundamental knowledge that will have long-lasting utility in a rapidly changing technical society.

DEGREE REQUIREMENTS

All degree programs in the department require that students attain a minimum GPA of 2.00 in the engineering core and in the major and take a minimum of 50 upper-division semester hours in order to be eligible for graduation. Also, the department may require additional or remedial course work for those students who have demonstrated a trend toward academic difficulties.

GRADUATION REQUIREMENTS

In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See “University Graduation Requirements,” page 74.

COURSE REQUIREMENTS

General Studies

See “Course Requirements,” page 213, for General Studies, school, and engineering core course requirements.

Engineering Core

Students in the Department of Mechanical and Aerospace Engineering are required to take the following from among the choices shown under “Engineering Core Requirement,” page 213, as part of the engineering core requirements:

ECE 100 Introduction to Engineering Design CS	4
ECE 201 Electrical Networks I	4
ECE 210 Engineering Mechanics I: Statics.....	3
ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 300 Intermediate Engineering Design L	3
ECE 313 Introduction to Deformable Solids.....	3
ECE 340 Thermodynamics.....	3
ECE 350 Structure and Properties of Materials	3
Total	26

AEROSPACE ENGINEERING—B.S.E.

The goal of the Aerospace Engineering program is to provide students with an education in technological areas critical to the design and development of aerospace vehicles and systems. The program emphasizes aeronautical engineering with topics in required courses covering aerodynamics, aerospace materials, aerospace structures, propulsion, flight mechanics, aircraft performance, and stability and control. Astronautic topics such as orbital mechanics, attitude dynamics, spacecraft control, and rocket propulsion are also covered in required courses.

Design is integrated throughout the curriculum beginning with ECE 100 Introduction to Engineering Design and followed later by ECE 300 Intermediate Engineering Design, both of which focus on basic design theory as well as professional practice. These required courses are followed by topic-specific design content in aerospace engineering courses in the junior and senior years. The senior capstone design course integrates design and analysis topics from the earlier courses and completes the required design sequence. This sequence includes a minimum of one-half year of required design. In addition, many of the aerospace technical electives have design content.

Laboratory experience is provided in the areas of aerodynamics, aerospace structures, and vibrations. Laboratory facilities include four major wind tunnels, an integrated mechanical-testing laboratory, a controls laboratory, and a vibrations laboratory.

Aerospace Engineering Major

Aerospace Engineering students are required to take the following two courses in addition to those required for the major:

MAT 242 Elementary Linear Algebra	2
PHY 361 Introductory Modern Physics.....	3

The Aerospace Engineering major consists of the following courses:

ECE 384 Numerical Methods for Engineers	4
MAE 317 Dynamic Systems and Control.....	3
MAE 319 Measurements and Data Analysis	3
MAE 361 Aerodynamics I.....	3
MAE 413 Aircraft Performance, Stability, and Control	3
MAE 415 Vibration Analysis.....	4
MAE 425 Aerospace Structures	4
MAE 444 Fundamentals of Aerospace Design.....	3
MAE 460 Gas Dynamics	3
MAE 462 Space Vehicle Dynamics and Control.....	3
MAE 463 Propulsion	3
MAE 464 Aerospace Laboratory	3
MAE 468 Aerospace Systems Design L.....	3
Area of study (technical electives).....	7
Total	49

Aerospace Engineering Areas of Study

To further the design experience, all Aerospace Engineering students must choose at least one technical elective from the following list of courses:

MAE 426 Design of Aerospace Structures	3
MAE 465 Rocket Propulsion.....	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

MAE 466 Rotary Wing Aerodynamics and Performance.....	3
MAE 467 Aircraft Performance	3
MAE 469 Projects in Astronautics or Aeronautics	3

The remaining technical elective(s) may be selected from among any of the courses listed in the following course tables or from courses listed under the Mechanical Engineering areas of study. The courses are grouped so that the student may select an elective package of closely related courses. A student may, with prior approval of the advisor and department, select a general area and a corresponding set of courses not listed that would support a career objective not covered by the categories shown below. *Note:* MAE 371 may *not* be substituted for MAE 361, MAE 422 may *not* be substituted for MAE 425, and MAE 441 may *not* be substituted for MAE 444.

Aerodynamics. Select from these courses:

MAE 372 Fluid Mechanics.....	3
MAE 435 Turbomachinery.....	3
MAE 461 Aerodynamics II.....	3
MAE 463 Propulsion.....	3
MAE 466 Rotary Wing Aerodynamics and Performance.....	3
MAE 471 Computational Fluid Dynamics.....	3
MAE 490 Projects in Design and Development <i>L</i>	3
MAT 421 Applied Computational Methods <i>CS</i>	3

Aerospace Materials. Select from these courses:

MAE 455 Polymers and Composites.....	3
MSE 355 Introduction to Materials Science and Engineering.....	3
MSE 420 Physical Metallurgy	3
MSE 440 Mechanical Properties of Solids	3
MSE 441 Analysis of Material Failures.....	3
MSE 450 X-ray and Electron Diffraction	3
MSE 471 Introduction to Ceramics.....	3

Aerospace Structures. Select from these courses:

MAE 404 Finite Elements in Engineering.....	3
MAE 426 Design of Aerospace Structures.....	3
MAE 455 Polymers and Composites.....	3
MAE 490 Projects in Design and Development <i>L</i>	3

Computer Methods. Select from these courses:

ASE 485 Engineering Statistics <i>CS</i>	3
CSE 310 Data Structures and Algorithms	3
CSE 422 Microprocessor System Design II.....	4
CSE 428 Computer-Aided Processes.....	3
IEE 463 Computer-Aided Manufacturing and Control <i>CS</i>	3
IEE 475 Simulating Stochastic Systems <i>CS</i>	3
MAE 404 Finite Elements in Engineering.....	3
MAE 406 CAD/CAM Applications in MAE.....	4
MAE 471 Computational Fluid Dynamics.....	3
MAE 541 CAD Tools for Engineers.....	3
MAT 421 Applied Computational Methods <i>CS</i>	3
MAT 423 Numerical Analysis I <i>CS</i>	3
MAT 425 Numerical Analysis II <i>CS</i>	3

Design. Select from these courses:

MAE 341 Mechanism Analysis and Design.....	3
MAE 404 Finite Elements in Engineering.....	3
MAE 406 CAD/CAM Applications in MAE.....	4
MAE 426 Design of Aerospace Structures	3
MAE 435 Turbomachinery	3
MAE 442 Mechanical Systems Design	3
MAE 446 Thermal Systems Design	3
MAE 455 Polymers and Composites.....	3
MAE 466 Rotary Wing Aerodynamics and Performance.....	3

MAE 467 Aircraft Performance	3
MAE 490 Projects in Design and Development <i>L</i>	3
MSE 440 Mechanical Properties of Solids	3
MSE 441 Analysis of Material Failures.....	3

Mechanical. Any courses listed under the Mechanical Engineering concentrations except MAE 371, 422, and 441 may be selected.

Propulsion. Select from these courses:

MAE 382 Thermodynamics.....	3
MAE 388 Heat Transfer.....	3
MAE 434 Internal Combustion Engines.....	3
MAE 435 Turbomachinery	3
MAE 436 Combustion	3
MAE 461 Aerodynamics II.....	3
MAE 465 Rocket Propulsion.....	3
MAE 466 Rotary Wing Aerodynamics and Performance.....	3
MAE 471 Computational Fluid Dynamics	3
MAE 490 Projects in Design and Development <i>L</i>	3

System Dynamics and Control. Select from these courses:

CSE 428 Computer-Aided Processes.....	3
EEE 480 Feedback Systems.....	4
EEE 482 Introduction to State Space Methods	3
MAE 417 Control System Design	3
MAE 447 Robotics and Its Influence on Design	3
MAE 469 Projects in Astronautics or Aeronautics	3
MAE 490 Projects in Design and Development <i>L</i>	3

TYPICAL FOUR-YEAR SEQUENCE

The first two years are usually devoted to the General Studies and engineering core requirements. Thus, the degree programs in the department share essentially the same course schedule for that period of time. A typical schedule is given below.

**Aerospace Engineering
Program of Study
Typical Four-Year Sequence**

First Year

First Semester

CHM 114 General Chemistry for Engineers <i>SQ</i>	4
or CHM 116 General Chemistry <i>SQ</i> (4)	
ECE 100 Introduction to Engineering Design <i>CS</i>	4
or HU/SB elective ¹	
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total	15

Second Semester

ENG 102 First-Year Composition.....	3
MAT 242 Elementary Linear Algebra	2
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ²	3
PHY 122 University Physics Laboratory I <i>SQ</i> ²	1
HU/SB and awareness area course ¹	3
or ECE 100 Introduction to Engineering Design <i>CS</i> (4)	
Total	16

Second Year

First Semester

ECE 210 Engineering Mechanics I: Statics.....	3
ECE 350 Structure and Properties of Materials	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3

PHY 131 University Physics II: Electricity and Magnetism SQ ³	3
PHY 132 University Physics Laboratory II SQ ³	1
Total	17

Second Semester

ECE 201 Electrical Networks I.....	4
ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 313 Introduction to Deformable Solids.....	3
ECE 340 Thermodynamics.....	3
ECE 384 Numerical Methods for Engineers.....	4
Total	17

Third Year

First Semester

ECE 300 Intermediate Engineering Design L.....	3
MAE 317 Dynamic Systems and Control.....	3
MAE 319 Measurements and Data Analysis.....	3
MAE 361 Aerodynamics I.....	3
MAE 425 Aerospace Structures.....	4
Total	16

Second Semester

MAE 413 Aircraft Performance, Stability, and Control.....	3
MAE 444 Fundamentals of Aerospace Design.....	3
MAE 460 Gas Dynamics.....	3
PHY 361 Introductory Modern Physics.....	3
HU/SB and awareness area course ¹	3
Total	15

Fourth Year

First Semester

MAE 415 Vibration Analysis.....	4
MAE 462 Space Vehicle Dynamics and Control.....	3
MAE 463 Propulsion.....	3
MAE 464 Aerospace Laboratory.....	3
HU/SB and awareness area course ¹	3
Total	16

Second Semester

MAE 468 Aerospace Systems Design L.....	3
HU/SB and awareness area courses ¹	6
Required design technical elective.....	3
Technical elective(s).....	4
Total	16

¹ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to satisfy HU or SB requirements.
² Both PHY 121 and 122 must be taken to secure SQ credit.
³ Both PHY 131 and 132 must be taken to secure SQ credit.

MECHANICAL ENGINEERING—B.S.E.

Mechanical engineering is a creative discipline that draws upon a number of basic sciences to design the devices, machines, processes, and systems that involve mechanical work and its conversion from and into other forms. It includes the conversion of thermal, chemical, and nuclear energy into mechanical energy through various engines and power plants; the transport of energy via devices such as heat exchangers, pipelines, gears, and linkages; and the use of energy to perform a variety of tasks for the benefit of society, such as in transportation vehicles of all types, man-

ufacturing tools and equipment, and household appliances. Furthermore, since all hardware products must be constructed of solid materials and because most products contain parts that transmit forces, mechanical engineering is involved in the structural integrity and materials selection for almost every product on the market.

Mechanical engineers are employed in virtually every kind of industry. They are involved in seeking new knowledge through research, in generating creative design and development, and in the production, control, management, and sales of the devices and systems needed by society. Therefore, a major strength of a mechanical engineering education is the flexibility it provides in future employment opportunities for its graduates.

The undergraduate curriculum includes the study of the principles governing the use of energy; the principles of design, instruments and control devices; and the application of these studies to the creative solution of practical, modern problems.

Design is integrated throughout the curriculum, beginning with ECE 100 Introduction to Engineering Design and followed later by ECE 300 Intermediate Engineering Design, both of which focus on basic design theory as well as professional practice. These required courses are followed by topic specific design content in mechanical engineering courses in the junior and senior years. The senior capstone design course combines the design topics from the earlier courses and completes the required design sequence. In addition, many of the mechanical technical electives have design content.

Laboratory experience is provided in the areas of thermo-fluid systems, mechanics of materials, and controls. Laboratory facilities include a thermal systems laboratory, an integrated mechanical-testing laboratory, a controls laboratory, and a manufacturing laboratory.

Mechanical Engineering Major

Mechanical Engineering students are required to select the following supplemental courses:

ECE 384 Numerical Methods for Engineers.....	4
MAT 242 Elementary Linear Algebra.....	2
PHY 361 Introductory Modern Physics.....	3

The Mechanical Engineering major requires the following departmental courses:

MAE 317 Dynamic Systems and Control.....	3
MAE 319 Measurements and Data Analysis.....	3
MAE 371 Fluid Mechanics.....	3
MAE 388 Heat Transfer.....	3
MAE 422 Mechanics of Materials.....	4
MAE 441 Principles of Design.....	3
MAE 443 Engineering Design.....	3
MAE 490 Projects in Design and Development L.....	3
MAE 491 Experimental Mechanical Engineering.....	3
Area of study (technical electives).....	17
Total	45

Mechanical Engineering Areas of Study

Technical electives may be selected from among any of the following courses or from courses listed under the Aerospace Engineering areas of study. The courses are

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

grouped to assist a student in identifying areas of specialization. Students preferring a broader technical background may choose courses from different areas. Generally, no more than two technical elective courses from outside the department are allowed. Credit for courses not on the list requires prior approval of the advisor and department. Mechanical Engineering students may not use MAE 361, 425, or 444 to fulfill degree requirements.

Aerospace. Any courses listed under the Aerospace Engineering areas of study except MAE 361, 425, and 444 may be selected.

Biomechanical. Select from these courses:

BME 411 Biomedical Engineering I	3
BME 412 Biomedical Engineering II	3
BME 416 Biomechanics	3
BME 419 Biocontrol Systems	3
EEE 302 Electrical Networks II	3
EEE 434 Quantum Mechanics for Engineers	3

Computer Methods. Select from these courses:

ASE 485 Engineering Statistics CS	3
CSE 310 Data Structures and Algorithms	3
CSE 422 Microprocessor System Design II	4
CSE 428 Computer-Aided Processes	3
IEE 463 Computer-Aided Manufacturing and Control CS	3
IEE 475 Simulating Stochastic Systems CS	3
MAE 404 Finite Elements in Engineering	3
MAE 406 CAD/CAM Applications in MAE	4
MAE 471 Computational Fluid Dynamics	3
MAE 541 CAD Tools for Engineers	3
MAT 421 Applied Computational Methods CS	3
MAT 423 Numerical Analysis I CS	3
MAT 425 Numerical Analysis II CS	3

Control and Dynamic Systems. Select from these courses:

CSE 428 Computer-Aided Processes	3
EEE 360 Energy Conversion and Transport	4
IEE 463 Computer-Aided Manufacturing and Control CS	3
MAE 413 Aircraft Performance, Stability, and Control	3
MAE 417 Control System Design	3
MAE 462 Space Vehicle Dynamics and Control	3
MAE 467 Aircraft Performance	3

Design. Select from these courses:

MAE 341 Mechanism Analysis and Design	3
MAE 351 Manufacturing Processes	3
MAE 404 Finite Elements in Engineering	3
MAE 406 CAD/CAM Applications in MAE	4
MAE 413 Aircraft Performance, Stability, and Control	3
MAE 417 Control System Design	3
MAE 434 Internal Combustion Engines	3
MAE 435 Turbomachinery	3
MAE 442 Mechanical Systems Design	3
MAE 446 Thermal Systems Design	3
MAE 447 Robotics and Its Influence on Design	3
MAE 462 Space Vehicle Dynamics and Control	3
MAE 467 Aircraft Performance	3

Energy Systems. Select from these courses:

EEE 360 Energy Conversion and Transport	4
MAE 372 Fluid Mechanics	3
MAE 382 Thermodynamics	3
MAE 434 Internal Combustion Engines	3
MAE 435 Turbomachinery	3

MAE 436 Combustion	3
MAE 446 Thermal Systems Design	3

Engineering Mechanics. Select from these courses:

MAE 341 Mechanism Analysis and Design	3
MAE 402 Introduction to Continuum Mechanics	3
MAE 404 Finite Elements in Engineering	3
MAE 413 Aircraft Performance, Stability, and Control	3
MAE 415 Vibration Analysis	4
MAE 426 Design of Aerospace Structures	3
MAE 442 Mechanical Systems Design	3
MAE 460 Gas Dynamics	3
MAE 461 Aerodynamics II	3
MAE 471 Computational Fluid Dynamics	3
MAT 421 Applied Computational Methods CS	3
MAT 423 Numerical Analysis I CS	3
MSE 440 Mechanical Properties of Solids	3

Manufacturing. Select from these courses:

CSE 428 Computer-Aided Processes	3
IEE 300 Economic Analysis for Engineers	3
IEE 374 Quality Control CS	3
IEE 461 Production Control	3
IEE 463 Computer-Aided Manufacturing and Control CS	3
MAE 341 Mechanism Analysis and Design	3
MAE 351 Manufacturing Processes	3
MAE 404 Finite Elements in Engineering	3
MAE 442 Mechanical Systems Design	3
MAE 447 Robotics and Its Influence on Design	3
MAE 455 Polymers and Composites	3
MSE 355 Introduction to Materials Science and Engineering	3
MSE 420 Physical Metallurgy	3
MSE 431 Corrosion and Corrosion Control	3
MSE 440 Mechanical Properties of Solids	3

Stress Analysis, Failure Prevention, and Materials.

Select from these courses:

MAE 341 Mechanism Analysis and Design	3
MAE 404 Finite Elements in Engineering	3
MAE 426 Design of Aerospace Structures	3
MAE 447 Robotics and Its Influence on Design	3
MAE 455 Polymers and Composites	3
MSE 355 Introduction to Materials Science and Engineering	3
MSE 420 Physical Metallurgy	3
MSE 431 Corrosion and Corrosion Control	3
MSE 440 Mechanical Properties of Solids	3
MSE 450 X-ray and Electron Diffraction	3

Thermosciences. Select from these courses:

MAE 372 Fluid Mechanics	3
MAE 382 Thermodynamics	3
MAE 433 Air Conditioning and Refrigeration	3
MAE 434 Internal Combustion Engines	3
MAE 435 Turbomachinery	3
MAE 436 Combustion	3
MAE 446 Thermal Systems Design	3
MAE 460 Gas Dynamics	3
MAE 463 Propulsion	3
MAE 471 Computational Fluid Dynamics	3

**Mechanical Engineering
Program of Study
Typical Four-Year Sequence**

First Year

First Semester

CHM 114 General Chemistry for Engineers SQ	4
or CHM 116 General Chemistry SQ (4)	

ECE 100 Introduction to Engineering Design CS or HU/SB elective ¹	4
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I MA.....	4
Total	15

Second Semester

ENG 102 First-Year Composition.....	3
MAT 242 Elementary Linear Algebra.....	2
MAT 271 Calculus with Analytic Geometry II MA.....	4
PHY 121 University Physics I: Mechanics SQ ²	3
PHY 122 University Physics Laboratory I SQ ²	1
HU/SB and awareness area course ¹	3
or ECE 100 Introduction to Engineering Design CS (4).....	—
Total	16

Second Year

First Semester

ECE 210 Engineering Mechanics I: Statics.....	3
ECE 350 Structure and Properties of Materials.....	3
MAT 272 Calculus with Analytic Geometry III MA.....	4
MAT 274 Elementary Differential Equations MA.....	3
PHY 131 University Physics II: Electricity and Magnetism SQ ³	3
PHY 132 University Physics Laboratory II SQ ³	1
Total	17

Second Semester

ECE 201 Electrical Networks I.....	4
ECE 212 Engineering Mechanics II: Dynamics.....	3
ECE 313 Introduction to Deformable Solids.....	3
ECE 340 Thermodynamics.....	3
ECE 384 Numerical Methods for Engineers.....	4
Total	17

Third Year

First Semester

ECE 300 Intermediate Engineering Design L.....	3
MAE 317 Dynamic Systems and Control.....	3
MAE 319 Measurements and Data Analysis.....	3
MAE 371 Fluid Mechanics.....	3
MAE 422 Mechanics of Materials.....	4
Total	16

Second Semester

MAE 388 Heat Transfer.....	3
MAE 441 Principles of Design.....	3
HU/SB and awareness area courses ¹	6
Technical elective(s).....	4
Total	16

Fourth Year

First Semester

MAE 491 Experimental Mechanical Engineering.....	3
PHY 361 Introductory Modern Physics.....	3
HU/SB and awareness area course ¹	3
Technical electives.....	7
Total	16

Second Semester

MAE 443 Engineering Design.....	3
MAE 490 Projects in Design and Development L.....	3
HU/SB and awareness area course ¹	3

Technical electives	6
Total	15

- ¹ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to satisfy HU or SB requirements.
- ² Both PHY 121 and 122 must be taken to secure SQ credit.
- ³ Both PHY 131 and 132 must be taken to secure SQ credit.

MECHANICAL AND AEROSPACE ENGINEERING (MAE)

MAE 317 Dynamic Systems and Control. (3)

fall and spring

Modeling and representations of dynamic physical systems, including transfer functions, block diagrams, and state equations. Transient response. Principles of feedback control and linear system analysis, including root locus and frequency response. Prerequisite: ECE 312. Pre- or corequisite: ECE 386.

MAE 319 Measurements and Data Analysis. (3)

fall and spring

Theory of measurement systems, sensors, digital data acquisition, signal processing and statistical analysis. Computer simulations and real-time experiments designed to illustrate these topics. Lecture, lab. Prerequisite: ECE 201. Pre- or corequisite: MAE 317.

MAE 341 Mechanism Analysis and Design. (3)

once a year

Positions, velocities, and accelerations of machine parts; cams, gears, flexible connectors, and rolling contact; introduction to synthesis. Prerequisite: ECE 312.

MAE 351 Manufacturing Processes. (3)

fall and spring

Production technique and equipment. Casting and molding, forming, machining, joining and assembly, computer-integrated manufacturing, rapid prototyping, and electronics manufacturing. Cross-listed as IEE 360. Credit is allowed for only IEE 360 or MAE 351. Prerequisite: ECE 350.

MAE 361 Aerodynamics I. (3)

once a year

Fluid statics, conservation principles, stream function, velocity potential, vorticity, inviscid flow, Kutta-Joukowski, thin-airfoil theory, and panel methods. Prerequisites: ECE 312, 340.

MAE 371 Fluid Mechanics. (3)

fall and spring

Introductory concepts of fluid motions; fluid statics; control volume forms of basic principles; viscous internal flows. Prerequisites: ECE 312, 340.

MAE 372 Fluid Mechanics. (3)

once a year

Applies basic principles of fluid mechanics to problems in viscous and compressible flow. Prerequisites: ECE 384; MAE 361 (or 371).

MAE 382 Thermodynamics. (3)

once a year

Applied thermodynamics; gas mixtures, psychrometrics, property relationships, power and refrigeration cycles, and reactive systems. Prerequisite: ECE 340.

MAE 388 Heat Transfer. (3)

fall and spring

Steady and unsteady heat conduction, including numerical solutions; thermal boundary layer concepts and applications to free and forced convection. Thermal radiation concepts. Prerequisites: ECE 384; MAE 361 (or 371).

MAE 402 Introduction to Continuum Mechanics. (3)

once a year

Applies the principles of continuum mechanics to such fields as flow-in porous media, biomechanics, electromagnetic continua, and magneto-fluid mechanics. Prerequisites: ECE 313; MAE 361 (or 371); MAT 242 (or 342).

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MAE 404 Finite Elements in Engineering. (3)*once a year*

Introduction to ideas and methodology of finite element analysis. Applications to solid mechanics, heat transfer, fluid mechanics, and vibrations. Prerequisites: ECE 313; MAT 242 (or 342).

MAE 406 CAD/CAM Applications in MAE. (4)*once a year*

Solution of engineering problems with the aid of state-of-the-art software tools in solid modeling, engineering analysis, and manufacturing; selection of modeling parameters; reliability tests on software. 3 hours lecture, 3 hours lab. Prerequisites: MAE 441; instructor approval.

MAE 413 Aircraft Performance, Stability, and Control. (3)*spring*

Aircraft performance, cruise, climbing and turning flights, energy maneuverability, 6 DOF equations for aircraft, aerodynamic stability derivatives, flight stability/control. Prerequisites: MAE 317, 361.

MAE 415 Vibration Analysis. (4)*fall*

Free and forced response of single and multiple degree of freedom systems, continuous systems; applications in mechanical and aerospace systems numerical methods. Lecture, lab. Prerequisites: ECE 312; MAE 319, 422 (or 425); MAT 242 (or 342).

MAE 417 Control System Design. (3)*once a year*

Tools and methods of control system design and compensation, including simulation, response optimization, frequency domain techniques, state variable feedback, and sensitivity analysis. Introduction to nonlinear and discrete time systems. Prerequisite: MAE 317.

MAE 422 Mechanics of Materials. (4)*fall and spring*

Failure theories, energy methods, finite element methods, plates, torsion of noncircular members, unsymmetrical bending, shear center, and beam column. Lecture, lab. Prerequisites: ECE 313; MAT 242 (or 342). Pre- or corequisite: ECE 384.

MAE 425 Aerospace Structures. (4)*fall*

Stability, energy methods, finite element methods, torsion, unsymmetrical bending and torsion of multicelled structures, design of aerospace structures. Lecture, lab. Prerequisites: ECE 313; MAT 242 (or 342).

MAE 426 Design of Aerospace Structures. (3)*once a year*

Flight vehicle loads, design of semimonocoque structures, local buckling and crippling, fatigue, aerospace materials, composites, joints, and finite element applications. Prerequisites: MAE 361, 425.

MAE 433 Air Conditioning and Refrigeration. (3)*once a year*

Air conditioning processes; environmental control; heating and cooling loads; psychrometry; refrigeration cycles. Prerequisite: MAE 388 or MET 432 or instructor approval.

MAE 434 Internal Combustion Engines. (3)*once a year*

Performance characteristics, combustion, carburetion and fuel-injection, and the cooling and control of internal combustion engines. Computer modeling. Lab. Prerequisite: MAE 388.

MAE 435 Turbomachinery. (3)*once a year*

Design and performance of turbomachines, including steam, gas and hydraulic turbines, centrifugal pumps, compressors, fans, and blowers. Pre- or corequisite: MAE 361 or 371.

MAE 436 Combustion. (3)*once a year*

Thermochemical and reaction rate processes; combustion of gaseous and condensed-phase fuels. Applications to propulsion and heating systems. Pollutant formation. Prerequisite: MAE 388.

MAE 441 Principles of Design. (3)*fall and spring*

Conceptual and embodiment design of mechanical elements; form synthesis; material selection, failure modes, manufacturability tolerances, common mechanisms, and machine elements. Lecture, lab (project). Prerequisites: ECE 300, 350. Pre- or corequisites: MAE 319, 422 (or 425).

MAE 442 Mechanical Systems Design. (3)*once a year*

Applies design principles and techniques to the synthesis, modeling, and optimization of mechanical, electromechanical, and hydraulic systems. Prerequisites: MAE 422 (or 425), 441.

MAE 443 Engineering Design. (3)*fall and spring*

Group projects to design engineering components and systems. Problem definition ideation, modeling, and analysis; emphasizes decision making and documentation activities. 6 hours lab. Prerequisite: MAE 441.

MAE 444 Fundamentals of Aerospace Design. (3)*spring*

Design theory and design tools applied to aerospace engineering. Engineering drawings, solid modeling, RFP's, Federal Aviation Regulations and military specifications, aircraft sizing, rapid prototyping. Lab, projects. Prerequisites: ECE 300, 350; MAE 319, 361, 425. Pre- or corequisite: MAE 413.

MAE 446 Thermal Systems Design. (3)*once a year*

Applies engineering principles and techniques to the modeling and analysis of thermal systems and components. Presents and demonstrates optimization techniques and their use. Prerequisite: ECE 300; MAE 388.

MAE 447 Robotics and Its Influence on Design. (3)*once a year*

Robot applications, configurations, singular positions, and work space; modes of control; vision; programming exercises; design of parts for assembly. Prerequisite: MAE 317.

MAE 455 Polymers and Composites. (3)*fall*

Relationship between chemistry, structure, and properties of engineering polymers. Design, properties, and behavior of fiber composite systems. Cross-listed as MSE 470. Credit is allowed for only MAE 455 or MSE 470. Prerequisite: ECE 350.

MAE 460 Gas Dynamics. (3)*spring*

Compressible flow at subsonic and supersonic speeds; duct flow; normal and oblique shocks, perturbation theory, and wind tunnel design. Prerequisites: ECE 384; MAE 361 (or 371).

MAE 461 Aerodynamics II. (3)*once a year*

Transonic/hypersonic flows, wing theory, Navier-Stokes, laminar/turbulent shear flows, pressure drop in tubes, separation, drag, viscous/inviscid interaction, and wing design. Prerequisite: MAE 460.

MAE 462 Space Vehicle Dynamics and Control. (3)*fall*

Attitude dynamics and control, launch vehicles, orbital mechanics, orbital transfer/rendezvous, space mission design, space structures, spacecraft control systems design. Prerequisite: MAE 317.

MAE 463 Propulsion. (3)*fall*

Fundamentals of gas-turbine engines and design of components. Principles and design of rocket propulsion and alternative devices. Lecture, design projects. Prerequisites: ECE 384; MAE 382 (or 460).

MAE 464 Aerospace Laboratory. (3)*fall*

Aerodynamic flow parameters; flow over airfoils and bodies of revolution; flow visualization; computer-aided data acquisition and processing; boundary layer theory. 1 hour lecture, 4 hours lab. Prerequisites: ECE 384; MAE 319, 460.

MAE 465 Rocket Propulsion. (3)*once a year*

Rocket flight performance; nozzle design; combustion of liquid and solid propellants; component design; advanced propulsion systems; interplanetary missions; testing. Prerequisite: MAE 382 or 460.

MAE 466 Rotary Wing Aerodynamics and Performance. (3)*once a year*

Introduction to helicopter and propeller analysis techniques. Momentum, blade-element, and vortex methods. Hover and forward flight. Ground effect, autorotation, and compressibility effects. Prerequisites: both ECE 384 and MAE 361 or only instructor approval.

MAE 467 Aircraft Performance. (3)*once a year*

Integration of aerodynamic and propulsive forces into aircraft performance design. Estimation of drag parameters for design. Engine, airfoil selection. Conceptual design methodology. Lecture, design projects. Prerequisite: MAE 361 or 371. Pre- or corequisite: MAE 444.

MAE 468 Aerospace Systems Design. (3)*fall and spring*

Group projects related to aerospace vehicle design, working from mission definition and continuing through preliminary design. Prerequisites: MAE 413, 444. Pre- or corequisite: MAE 463.

*General Studies: L***MAE 469 Projects in Astronautics or Aeronautics. (3)***fall and spring*

Various multidisciplinary team projects available each semester. Projects include design of high-speed rotorcraft autonomous vehicles, liquid-fueled rockets, microaerial vehicles, satellites. Prerequisite: instructor approval.

MAE 471 Computational Fluid Dynamics. (3)*once a year*

Numerical solutions for selected problems in fluid mechanics. Prerequisites: ECE 384; MAE 361 (or 371).

MAE 490 Projects in Design and Development. (3)*fall and spring*

Capstone projects in fundamental or applied aspects of engineering. Prerequisites: MAE 441, 491.

*General Studies: L***MAE 491 Experimental Mechanical Engineering. (3)***fall and spring*

Experimental and analytical studies of phenomena and performance of fluid flow, heat transfer, thermodynamics, refrigeration, and mechanical power systems. 6 hours lab. Prerequisites: MAE 319, 388.

MAE 498 Pro-Seminar. (1-3)*not regularly offered*

Special topics for advanced students. Applies the engineering disciplines to design and analysis of modern technical devices and systems. Prerequisite: instructor approval.

MAE 504 Laser Diagnostics. (3)*spring*

Fundamentals of optics and the interaction of light with matter. Laser sources, laser spectroscopy, velocimetry, particle sizing, and surface characterization.

MAE 505 Perturbation Methods. (3)*not regularly offered*

Nonlinear oscillations, strained coordinates, renormalization, multiple scales, boundary layers, matched asymptotic expansions, turning point problems, and WKBJ method. Cross-listed as MAT 505. Credit is allowed for only MAE 505 or MAT 505.

MAE 506 Advanced System Modeling, Dynamics, and Control. (3)*spring*

Lumped-parameter modeling of physical systems with examples. State variable representations and dynamic response. Introduction to modern control. Prerequisite: ASE 582 or MAT 442.

MAE 507 Optimal Control. (3)*fall*

Optimal control of systems. Calculus of variations, dynamic programming, linear quadratic regulator, numerical methods, and Pontryagin's principle. Cross-listed as EEE 587. Credit is allowed for only EEE 587 or MAE 507. Prerequisite: EEE 482 or MAE 506.

MAE 509 Robust Multivariable Control. (3)*spring*

Characterization of uncertainty in feedback systems, robustness analysis, synthesis techniques, multivariable Nyquist criteria, computer-aided analysis and design. Prerequisites: MAE 417, 506.

MAE 510 Dynamics and Vibrations. (3)*fall*

Lagrange's and Hamilton's equations, rigid body dynamics, gyroscopic motion, and small oscillation theory.

MAE 511 Acoustics. (3)*fall*

Principles underlying the generation, transmission, and reception of acoustic waves. Applications to noise control, architectural acoustics, random vibrations, and acoustic fatigue.

MAE 512 Random Vibrations. (3)*spring*

Review of probability theory, random processes, stationarity, power spectrum, white noise process, random response of single and multiple DOF systems, and Markov processes simulation. Prerequisite: MAE 510 or instructor approval.

MAE 515 Structural Dynamics. (3)*spring*

Free vibration and forced response of discrete and continuous systems, exact and approximate methods of solution, finite element modeling, and computational techniques. Prerequisite: MAE 510 or instructor approval.

MAE 518 Dynamics of Rotor-Bearing Systems. (3)*spring*

Natural whirl frequency, critical speed, and response analysis of rigid and flexible rotor systems. Bearing influence and representation. Stability analysis. Methods of balancing.

MAE 520 Solid Mechanics. (3)*fall*

Introduction to tensors: kinematics, kinetics, and constitutive assumptions leading to elastic, plastic, and viscoelastic behavior. Applications.

MAE 521 Structural Optimization. (3)*not regularly offered*

Linear and nonlinear programming. Problem formulation. Constrained and unconstrained optimization. Sensitivity analysis. Approximate techniques. FEM-based optimal design of mechanical and aerospace structures. Cross-listed as CEE 533. Credit is allowed for only CEE 533 or MAE 521. Prerequisite: instructor approval.

MAE 523 Theory of Plates and Shells. (3)*fall*

Linear and nonlinear theories of plates. Membrane and bending theories of shells. Shells of revolution. Prerequisite: MAE 520.

MAE 524 Theory of Elasticity. (3)*spring*

Formulation and solution of 2- and 3-dimensional boundary value problems. Prerequisite: MAE 520.

MAE 527 Finite Element Methods in Engineering Science. (3)*fall*

Discretization, interpolation, elemental matrices, assembly, and computer implementation. Application to solid and fluid mechanics, heat transfer, and time-dependent problems. Prerequisite: ASE 582.

MAE 536 Combustion. (3)*not regularly offered*

Thermodynamics; chemical kinetics of combustion. Explosion and ignition theories. Reactive gas dynamics. Structure, propagation, and stability of flames. Experimental methods. Prerequisite: MAE 436 or instructor approval.

MAE 540 Advances in Engineering Design Theory. (3)*fall*

Survey of research in engineering design process, artifact and design, knowledge, formal and informal logic, heuristic and numerical searches, theory of structure and complexity. Prerequisite: graduate standing.

MAE 541 CAD Tools for Engineers. (3)*fall*

Elements of computer techniques required to develop CAD software. Data structures, including lists, trees, and graphs. Computer graphics, including 2- and 3-dimensional algorithms and user interface techniques.

MAE 542 Geometric Modeling in CAD/CAM. (3)*spring*

Geometric and solid modeling, curve and surface design, CAD database architectures, and integration of solid modeling into engineering processes. Prerequisite: MAE 541 or instructor approval.

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MAE 544 Mechanical Design and Failure Prevention. (3)*fall*

Modes of mechanical failure; application of principles of elasticity and plasticity in multiaxial state of stress to design synthesis; failure theories; fatigue; creep; impact. Prerequisite: MAE 443.

MAE 546 CAD/CAM Applications in MAE. (4)*fall*

Solution of engineering problems with the aid of state-of-the-art software tools in solid modeling, engineering analysis, and manufacturing; selection of modeling parameters; reliability tests on software. Open only to students without previous credit for MAE 406. 3 hours lecture, 3 hours lab. Prerequisite: instructor approval.

MAE 547 Mechanical Design and Control of Robots. (3)*not regularly offered*

Homogeneous transformations, 3-dimensional kinematics, geometry of motion, forward and inverse kinematics, workspace and motion trajectories, dynamics, control, and static forces.

MAE 548 Mechanism Synthesis and Analysis. (3)*spring*

Algebraic and graphical methods for exact and approximate synthesis of cam, gear, and linkage mechanisms; design optimization; methods of planar motion analysis; characteristics of plane motion; spatial kinematics.

MAE 557 Mechanics of Composite Materials. (3)*spring*

Analysis of composite materials and applications. Micromechanical and macromechanical behavior. Classical lamination theory developed with investigation of bending-extension coupling.

MAE 560 Propulsion Systems. (3)*not regularly offered*

Design of air-breathing gas turbine engines for aircraft propulsion; mission analysis; cycle analysis; engine sizing; component design.

MAE 561 Computational Fluid Dynamics. (3)*spring*

Finite-difference and finite-volume techniques for solving the subsonic, transonic, and supersonic flow equations. Method of characteristics. Numerical grid-generation techniques. Prerequisite: MAE 571 or instructor approval.

MAE 563 Unsteady Aerodynamics. (3)*spring*

Unsteady incompressible and compressible flow. Wings and bodies in oscillatory and transient motions. Kernel function approach and panel methods. Aeroelastic applications. Prerequisite: MAE 460 or 461.

MAE 564 Advanced Aerodynamics. (3)*fall*

Perturbation method. Linearized subsonic and supersonic flows. Thin wing/slender body theories. Lifting surface theory. Panel method computation. Prerequisite: MAE 460 or 461.

MAE 566 Rotary-Wing Aerodynamics. (3)*fall*

Introduction to helicopter and propeller analysis techniques. Momentum, blade-element, and vortex methods. Hover and forward flight. Ground effect, autorotation, and compressibility effects. Prerequisite: MAE 361.

MAE 571 Fluid Mechanics. (3)*fall*

Basic kinematic, dynamic, and thermodynamic equations of the fluid continuum and their application to basic fluid models.

MAE 572 Inviscid Fluid Flow. (3)*spring*

Mechanics of fluids for flows in which the effects of viscosity may be ignored. Potential flow theory, waves, and inviscid compressible flows. Prerequisite: MAE 571.

MAE 573 Viscous Fluid Flow. (3)*fall*

Mechanics of fluids for flows in which the effects of viscosity are significant. Exact and approximate solutions of the Navier-Stokes system, laminar flow at low and high Reynolds number. Prerequisite: MAE 571.

MAE 575 Turbulent Shear Flows. (3)*fall*

Homogeneous, isotropic, and wall turbulence. Experimental results. Introduction to turbulent-flow calculations. Prerequisite: MAE 571.

MAE 577 Turbulent Flow Modeling. (3)*spring*

Reynolds equations and their closure. Modeling of simple and complex turbulent flows, calculations of internal and external flows, and application to engineering problems. Prerequisite: MAE 571.

MAE 581 Thermodynamics. (3)*fall*

Basic concepts and laws of classical equilibrium thermodynamics; applications to engineering systems. Introduction to statistical thermodynamics.

MAE 582 Statistical Thermodynamics. (3)*once a year*

Kinetic and quantum theory. Statistical mechanics; ensemble theory. Structure and thermodynamics of noninteracting and interacting particles. Boltzmann integro-differential equation. Prerequisite: graduate standing.

MAE 585 Conduction Heat Transfer. (3)*fall*

Basic equations and concepts of conduction heat transfer. Mathematical formulation and solution (analytical and numerical) of steady and unsteady, one- and multidimensional heat conduction and phase change problems. Prerequisites: ECE 386; MAE 388.

MAE 586 Convection Heat Transfer. (3)*spring*

Basic concepts and governing equations. Analysis of laminar and turbulent heat transfer for internal and external flows. Natural and mixed convection. Prerequisite: MAE 388.

MAE 587 Radiation Heat Transfer. (3)*fall*

Advanced concepts and solution methodologies for radiation heat transfer, including exchange of thermal radiation between surfaces, radiation in absorbing, emitting, and scattering media and radiation combined with conduction and convection. Prerequisite: MAE 388.

MAE 588 Two-Phase Flows and Boiling Heat Transfer. (3)*spring*

Pool and flow boiling heat transfer, condensation heat transfer, various models of vapor-liquid mixture flows, gas-solid mixture flows, and experimental measurement techniques.

MAE 589 Heat Transfer. (3)*fall*

Basic concepts; physical and mathematical models for heat transfer. Applications to conductive, convective, radiative, and combined mode heat transfer. Prerequisite: MAE 388.

MAE 594 Graduate Research Conference. (1)*fall and spring*

Topics in contemporary research. Required every semester of all departmental graduate students registered for 9 or more semester hours. Not for degree credit.

MAE 598 Special Topics. (1-4)*fall and spring*

Special topics courses, including the following, which are regularly offered, are open to qualified students. Possible topics:

- (a) Advanced Spacecraft Control. (1-3)
- (b) Aeroelasticity. (1-3)
- (c) Aerospace Vehicle Guidance and Control. (1-3)
- (d) Boundary Layer Stability. (1-3)
- (e) Hydrodynamic Stability. (1-3)
- (f) Plasticity. (1-3)
- (g) Polymers and Composites. (1-3)

Programs in Engineering Special Studies

Daniel F. Jankowski
Director
 (ECG 104) 480/965-1726

The major of Engineering Special Studies accommodates students whose educational objectives require more intensity of concentration on a particular subject or more curricular flexibility within an engineering discipline than the traditional departmental majors generally permit. The major is a School of Engineering program. Unlike the departmental major areas, however, there is not a separate faculty. The faculty teaching and advising in these programs are from the various departments within the School of Engineering.

For many students, engineering studies form the basis of preparation for professional engineering work where proficiency in the application of science and the physical and social technologies is brought to bear on problems of a large scope. The necessary breadth that these students seek often is not obtainable in traditional engineering fields. Rather, specially designed programs of course work that merge the required principles and approaches drawn from all fields of engineering and other pertinent disciplines are desired.

The B.S.E. degree in Engineering Special Studies is designed primarily for students intending to pursue engineering careers at a professional level in industry or graduate studies.

ENGINEERING SPECIAL STUDIES—B.S.E.

Premedical Engineering. In recent decades, the interrelation between engineering and medicine has become vigorous and exciting. Rapidly expanding technology dictates that engineering will continue to become increasingly involved in all branches of medicine. As this develops, so will the need for physicians trained in the engineering sciences—medical men and women with a knowledge of computer technology, transport phenomena, biomechanics, bioelectric phenomena, operations research, and cybernetics. This concentration is of special interest to students who desire entry into a medical college and who have medical interests in research, aerospace and undersea medicine, artificial organs, prostheses, biomedical engineering, or biophysics. Since both engineering and medicine have as their goal the well-being of humans, this program is compatible with any field of medical endeavor.

DEGREE REQUIREMENTS

A minimum of 128 semester hours is necessary for the B.S.E. degree in Engineering Special Studies with a concentration in Premedical Engineering. A minimum of 50 upper-division hours is required. Students must attain a GPA of at least 2.00 for the courses in the major field.

GRADUATION REQUIREMENTS

In addition to fulfilling school and major requirements, majors must satisfy all university graduation requirements. See "University Graduation Requirements," page 74.

Note: To fulfill medical school admission requirements, BIO 182 General Biology is required in addition to the degree requirements and is best taken in summer session before the Medical College Admission Test.

COURSE REQUIREMENTS

The course work for the undergraduate degree can be classified into the following categories (in semester hours):

First-Year Composition

Choose among the course combinations below	6
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
_____or_____	
ENG 105 Advanced First-Year Composition (3)	
Elective chosen with an advisor (3)	
_____or_____	
ENG 107 English for Foreign Students (3)	
ENG 108 English for Foreign Students (3)	
Total	6

General Studies/School Requirements

Humanities and Fine Arts/Social and Behavioral Sciences

ECN 111 Macroeconomic Principles <i>SB</i> ¹	3
or ECN 112 Microeconomic Principles <i>SB</i> ¹ (3)	
HU/SB and awareness area courses ²	12
Total	15

Literacy and Critical Inquiry

BME 413 Biomedical Instrumentation <i>L</i>	3
BME 423 Biomedical Instrumentation Laboratory <i>L</i>	1
ECE 300 Intermediate Engineering Design <i>L</i>	3
Total	7

Natural Sciences

PHY 121 University Physics I: Mechanics <i>SQ</i> ³	3
PHY 122 University Physics Laboratory I <i>SQ</i> ³	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ⁴	3
PHY 132 University Physics Laboratory II <i>SQ</i> ⁴	1
Total	8

Mathematical Studies

ECE 100 Introduction to Engineering Design <i>CS</i>	4
MAT 242 Elementary Linear Algebra	2
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
MAT 274 Elementary Differential Equations <i>MA</i>	3
Total	21
General Studies/school requirements total	51

Engineering Core

ECE 201 Electrical Networks I	4
ECE 210 Engineering Mechanics I: Statics	3
ECE 334 Electronic Devices and Instrumentation	4
ECE 340 Thermodynamics	3
ECE 350 Structure and Properties of Materials	3
Total	17

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

**Engineering Special Studies Program Major—
Premedical Engineering Concentration**

BIO 181 General Biology <i>SQ</i>	4
BME 201 Introduction to Bioengineering <i>L</i>	3
BME 318 Biomaterials.....	3
BME 331 Biomedical Engineering Transport I: Fluids.....	3
BME 334 Bioengineering Heat and Mass Transfer.....	3
BME 416 Biomechanics.....	3
BME 417 Biomedical Engineering Capstone Design I.....	3
BME 435 Physiology for Engineers.....	4
BME 470 Microcomputer Applications in Bioengineering.....	4
BME 490 Biomedical Engineering Capstone Design II.....	3
CHM 113 General Chemistry <i>SQ</i>	4
CHM 116 General Chemistry <i>SQ</i>	4
CHM 331 General Organic Chemistry.....	3
CHM 332 General Organic Chemistry.....	3
CHM 335 General Organic Chemistry Laboratory.....	1
CHM 336 General Organic Chemistry Laboratory.....	1
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
Technical elective.....	2
Total.....	54

¹ ECN 111 or 112 must be included to fulfill the HU and SB requirements.

² Engineering students may not use aerospace studies (AES) or military science (MIS) courses to fulfill HU and SB requirements.

³ Both PHY 121 and 122 must be taken to secure *SQ* credit.

⁴ Both PHY 131 and 132 must be taken to secure *SQ* credit.

**Premedical Engineering
Program of Study
Typical Four-Year Sequence**

First Year

First Semester

CHM 113 General Chemistry <i>SQ</i>	4
ECE 100 Introduction to Engineering Design <i>CS</i>	4
ENG 101 First-Year Composition.....	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
Total.....	15

Second Semester

CHM 116 General Chemistry <i>SQ</i>	4
ENG 102 First-Year Composition.....	3
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
Total.....	15

Second Year

First Semester

BIO 181 General Biology <i>SQ</i>	4
BME 201 Introduction to Bioengineering <i>L</i>	3
ECE 210 Engineering Mechanics I: Statics.....	3
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3
PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
Total.....	18

Second Semester

CHM 331 General Organic Chemistry.....	3
CHM 335 General Organic Chemistry Laboratory.....	1
ECE 201 Electrical Networks I.....	4
ECE 350 Structure and Properties of Materials.....	3
ECN 111 Macroeconomic Principles <i>SB</i>	3
or ECN 112 Microeconomic Principles <i>SB</i> (3)	
MAT 274 Elementary Differential Equations <i>MA</i>	3
Total.....	17

Third Year

First Semester

BME 331 Biomedical Engineering Transport I: Fluids.....	3
BME 334 Bioengineering Heat and Mass Transfer.....	4
CHM 332 General Organic Chemistry.....	3
ECE 300 Intermediate Engineering Design <i>L</i>	3
ECE 340 Thermodynamics.....	3
Total.....	16

Second Semester

BME 318 Biomaterials.....	3
BME 334 Bioengineering Heat and Mass Transfer.....	3
CHM 336 General Organic Chemistry Laboratory.....	1
ECE 334 Electronic Devices and Instrumentation.....	4
MAT 242 Elementary Linear Algebra <i>MA</i>	2
HU/SB and awareness area course ³	3
Total.....	16

Fourth Year

First Semester

BME 413 Biomedical Instrumentation <i>L</i>	3
BME 416 Biomechanics.....	3
BME 417 Biomedical Engineering Capstone Design I.....	3
BME 423 Biomedical Instrumentation Laboratory <i>L</i>	1
HU/SB and awareness area courses ³	6
Total.....	16

Second Semester

BME 470 Microcomputer Applications in Bioengineering.....	4
BME 490 Biomedical Engineering Capstone Design II.....	3
ECE 380 Probability and Statistics for Engineering Problem Solving <i>CS</i>	3
HU/SB and awareness area course ³	3
Technical elective.....	2
Total.....	15
Total degree requirements.....	128

¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.

² Both PHY 131 and 132 must be taken to secure *SQ* credit.

³ Engineering students may not use aerospace studies (AES) or military science (MIS) courses to satisfy HU or SB requirements.

The Katherine K. Herberger College of Fine Arts

J. Robert Wills, Ph.D., Dean

herbergercollege.asu.edu



The college offers a B.F.A. degree in Art with a concentration in painting.

Photo courtesy of Herberger College of Fine Arts

School of Art	270
Department of Dance	285
School of Music	290
Department of Theatre	305

PURPOSE

The Katherine K. Herberger College of Fine Arts at ASU provides both preprofessional and professional education in the arts disciplines and an opportunity for nonmajors to become culturally literate through participation and involvement in the creative and performing arts.

The college, through its programs in art, dance, music, and theatre, reflects a wide range of challenges facing the contemporary artist and scholar. The arts, as an integral part of the curriculum, offer the student a rewarding educational experience balanced and strengthened by studies in related fine arts areas, the humanities, social sciences, and the natural sciences.

In addition to professional curricula offered in each department and school, the college provides courses designed to meet the specific educational needs of students pursuing majors in other colleges throughout the university. The cultural life of the university community is further enriched by study opportunities offered at off-campus sites. The Herberger College of Fine Arts also offers community audiences many hours of cultural enjoyment through a myriad of concerts, art exhibitions, music and dance concerts, dramatic productions, operas, lectures, and seminars.

ORGANIZATION

The college houses the School of Art, the Department of Dance, the School of Music, and the Department of Theatre. An average of 2,600 students per semester enroll as majors in various degree programs offered through these units. The college also includes the ASU Art Museum and the Institute for Studies in the Arts.

ADMISSION

Students meeting the university requirements for admission may matriculate in the Herberger College of Fine Arts. Separate admission procedures and approvals are required for some programs within the college. Students must contact specific departments or schools for details.

Transfer of Community College Credits. The university standards for evaluation of transfer credit are listed under "Transfer Credit," page 57. Transfer students are encouraged to contact their department or school or the Herberger College of Fine Arts Undergraduate Student Academic Services (GHALL 127) to ensure a smooth transition to the Herberger College of Fine Arts. Credits transferred from any accredited junior or community college may be

accepted up to a maximum of 64 semester hours. A community college student planning to transfer at the end of his or her first or second year should plan to take community college courses that meet the requirements of the ASU curriculum selected. Students attending Arizona community colleges are permitted to follow the degree requirements specified in the ASU *General Catalog* in effect at the time they began their community college work, providing their college attendance has been continuous.

Courses transferred from community colleges are not accepted as upper-division credit at ASU. Arizona students are urged to refer to the *Course Applicability System* for transferability of specific courses from Arizona community colleges. In choosing courses at a community college, students should be aware that a minimum of 45 hours of work taken at the university must be upper-division credits. While attending a community college, it is suggested that students select courses similar to ASU General Studies lower-division courses in the major field.

For optimal course selection, access the ASU Transfer Guides on the Web at www.asu.edu/provost/articulation.

General Transfer Credit. Direct transfer of courses from other accredited institutions to the Herberger College of Fine Arts are subject to (1) the existence of parallel and equal courses in the college's curriculum and (2) departmental or school evaluation of studio courses with respect to performance standards. Every candidate for the bachelor's degree must earn a minimum of 30 semester hours in resident credit at ASU. Transfer students enrolled in the college must complete a minimum of 15 semester hours of resident credit in the major as approved by the faculty.

ADVISING

Advising is handled as a decentralized activity within the college. To offer personalized attention, each academic unit establishes its own graduation advising procedures. Students are encouraged to make appointments through the central office of their department or school.

Baccalaureate Degrees

The three baccalaureate degrees differ in curricula with respect to the amount of specialization permitted in the

major field. The B.A. degree provides a broad, scholarly, humanistic program, while the other two programs place greater emphasis upon the major field. See the "Herberger College of Fine Arts Baccalaureate Degrees and Majors" table, page 266, for more information.

The university General Studies curriculum plays an integral role within the educational mission of the university and as such constitutes an important component of all undergraduate degrees in the Herberger College of Fine Arts. See "General Studies," page 78, for more information.

In cooperation with the College of Education a K–12 endorsement for teacher certification is available in the disciplines of art, dance, music, and theatre for students preparing for a teaching career in the public schools. Students should, with the advice and counsel of their arts education advisors, fulfill the requirements for the appropriate area of specialization under the Bachelor of Fine Arts or Bachelor of Music degrees. In addition, a student wishing to be admitted to the Professional Teacher Preparation Program (PTPP) in the College of Education (leading to teaching certification) must consult with an advisor from the Office of Student Affairs in the College of Education before making application for the PTPP. Students must have completed 56 hours with a minimum GPA of 2.50 and also have submitted scores from either the Pre-Professional Skills Test (PPST) or the ACT. Further details on admission requirements and procedures for the PTPP can be found under "Teacher Education," page 179.

Minors

The Herberger College of Fine Arts provides an opportunity for students majoring in other disciplines to sustain their interest in the arts through a structured program of required courses and electives leading to a minor. The minor is not intended as a substitute for professional work in the arts, but as a complement to various liberal arts and preprofessional curricula.

Minors are offered in Art History, Dance, Music, and Theatre. The total number of semester hours required for a minor ranges from 18 to 22. Students should contact the relevant academic unit for specific requirements and guidelines regarding the minor.

Herberger College of Fine Arts Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Art	B.A.	Art history, digital arts, museum studies, studio art	School of Art
	B.F.A.	Art education, ceramics, drawing, fibers, intermedia, metals, painting, photography, printmaking, sculpture	School of Art
Dance	B.F.A.	Choreography, dance education, dance studies, performance	Department of Dance
Music	B.A.	—	School of Music
Music Education ¹	B.M.	Choral-general, instrumental, string	School of Music
Music Therapy ¹	B.M.	—	School of Music
Performance	B.M.	Guitar, jazz, keyboard, music theatre, orchestral instrument, piano accompanying, voice	School of Music
Theatre	B.A., B.F.A. ²	—	Department of Theatre
Theory and Composition	B.M.	Composition, theory	School of Music

¹ This major requires more than 120 semester hours to complete.

² Applications for this program are not being accepted at this time.

Graduate Degrees

Master's programs range from 30 to 60 semester hours, depending upon the degree chosen. Doctoral programs vary in scope and curricula. See the "Herberger College of Fine Arts Graduate Degrees and Majors" table, page 268, for more information. See the *Graduate Catalog* for specific requirements.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements. For more information, see "University Graduation Requirements," page 74.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 semester hours of approved course work in General Studies, as described under "General Studies," page 78. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses. General Studies courses are listed in the "General Studies Courses" table, page 81, in the course descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

Courses in the major or in a related field area may not be used to satisfy both the major and core area portions of the General Studies requirement. Concurrent listings in the literacy areas, numeracy (computer applications) areas, and awareness areas are an exception. Students are encouraged to consult with an academic advisor to ensure that they comply with all necessary requirements.

COLLEGE DEGREE REQUIREMENTS

The Herberger College of Fine Arts degree requirements supplement the General Studies requirement. Descriptions of additional required courses follow. Students are encouraged to consult with an academic advisor to ensure that they comply with all necessary requirements.

Fine arts majors must take at least six semester hours of fine arts course work in areas outside of the major school or department. These courses may be in art, dance, music, or theatre. A student may concurrently fulfill this requirement and the humanities and fine arts portion of the General Studies requirement by selecting approved courses as indicated in the *Schedule of Classes*. This requirement may also be met by taking *any* Herberger College of Fine Arts course outside of the student's major.

All B.A. degrees require the equivalent of 16 semester hours in one foreign language except for the B.A. degrees in Theatre and Art with a concentration in studio art. Foreign language study is strongly recommended but not required for these degree programs. Course work may be selected in any language and must follow the sequence of language courses 101, 102, 201, and 202. This requirement may be fulfilled at the secondary school level or by examination. If acquired in secondary school, two years of instruction in one foreign language is considered the equivalent of one year of college instruction. Transfer students are placed in language study at the level above completed work.

Candidates for the B.M. degree in Performance with a concentration in piano accompanying or voice and in Theory and Composition with a concentration in theory have specific foreign language requirements, which are stated

with each of the degree requirements. There is no foreign language requirement for other concentrations of the B.F.A. or B.M. degrees.

MAJOR REQUIREMENTS

The minimum requirement for a baccalaureate degree is the completion of 120 semester hours with a minimum cumulative GPA of 2.00. Of these 120 semester hours, at least 45 must be selected from upper-division courses.

Several professional programs within the college require additional semester hours for graduation and a higher cumulative GPA of their majors. To be acceptable as degree credit, all course work in the major discipline must show an earned grade of "C" (2.00) or higher.

In addition to the general information given below, consult the school and departmental sections that follow for specific degree requirements.

Bachelor of Arts (B.A.) Degree. The B.A. degree requires from 45 to 60 semester hours for the major. Depending on the major, 18 to 24 hours must be selected from upper-division (300- or 400-level) courses. The semester-hour requirements in the major are distributed between a field of specialization (30 to 53 hours) and one or more related fields (an additional 15 hours). The exact content of the major is selected by a student in consultation with an advisor under rules and regulations of the department or school concerned. A successful entrance audition is also required for admission to the B.A. degree in Music degree program.

Bachelor of Fine Arts (B.F.A.) Degree. The B.F.A. degree requires 52 to 79 semester hours for the major. At least 30 of these hours, depending on the major, must be selected from upper-division (300- or 400-level) courses. The curriculum for the major is designed as preprofessional study in art, dance, or theatre education. Auditions and/or interviews are required for admission to the B.F.A. degree programs in Dance and Theatre. Consult these departments for specific information.

Bachelor of Music (B.M.) Degree. The B.M. degree requires 79 semester hours for the major. The required number of upper-division (300- or 400-level) courses is dependent upon the area of specialization. The curriculum is designed to provide a broad yet concentrated preparation with a choice of specialization among various areas. See the "Herberger College of Fine Arts Baccalaureate Degrees and Majors" table, page 266, for available majors and concentrations. An entering undergraduate music student, regardless of the area of specialization, must pass an entrance audition in his or her primary performing medium (voice or instrument).

ACADEMIC STANDARDS

The terms of disqualification, reinstatement, and appeals are consistent with those set forth by the university under "Retention and Academic Standards," page 71, except for degree programs in Theatre. For the B.F.A. degree in Theatre with a concentration in theatre education, a student must have a minimum GPA of 3.00 in the major to enroll in upper-division courses and to remain in good standing. In addition, a student disqualified in any program is normally not eligible for reinstatement for two semesters.

Herberger College of Fine Arts Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Art	M.A.	Art education, art history	School of Art
	M.F.A.	Ceramics, drawing, fibers, intermedia, metals, painting, photographic studies, photography, printmaking, sculpture, wood	School of Art
Composition	M.M.	—	School of Music
Creative Writing	M.F.A. ¹	—	Creative Writing Committee
Curriculum and Instruction	Ph.D. ²	Art education	School of Art
Dance	M.F.A.	—	Department of Dance
History and Theory of Art ³	Ph.D.	—	School of Art
Music	M.A.	Ethnomusicology, music history and literature, music theory	School of Music
	D.M.A.	Choral conducting; music composition; music education; solo performance (instrumental, keyboard, piano pedagogy, voice)	School of Music
Music Education	M.M.	Choral music, general music, instrumental music, jazz studies	School of Music
Performance	M.M.	Music theatre/opera musical direction; music theatre/opera performance; performance pedagogy; piano accompanying; solo performance (instrumental, keyboard, voice)	School of Music
Theatre	M.A.	—	Department of Theatre
	M.F.A.	Performance, scenography, theatre for youth	Department of Theatre
	Ph.D.	Theatre for youth	Department of Theatre

¹ This program is administered by the Graduate College.

² This program is administered in collaboration with the College of Education and the Graduate College.

³ This major is jointly offered with the University of Arizona.

SPECIAL PROGRAMS

Working closely with faculty, visiting scholars, and artists-in-residence, students in all fields of the college participate in dynamic, innovative programs. Students receive a great deal of individual attention to their creative work and artistic development.

School of Art. The School of Art is one of the largest programs of its kind in the country and offers students a wide range of specialties in media, art history, and art education. The faculty are nationally recognized and provide excellent instruction in a curriculum with many different educational opportunities. Some of the unique offerings are in book-making and paperhanging, digital art, film, neon, video animation, and foundry. In addition, internships are available in galleries and museums throughout the Phoenix area. The Children's Art Workshop is an on-campus program taught by students in art education for school-age children in the metropolitan area. Northlight Gallery, a teaching gallery, hosts exhibitions organized and curated by students. Visiting artists and guest lecturers enrich the basic curriculum. Graduates of the School of Art have been accepted to top graduate schools and many are in leadership positions in art, education, and industry.

Department of Dance. Recognized as one of the top programs in the country, the Department of Dance emphasizes the choreography, dance education, performance, and theory of modern dance. Nationally prominent faculty and visiting artists create repertory for dance majors and for the Dance Arizona Repertory Theatre (DART), a student touring outreach company. An ambitious performance program

offers several concerts to the public each year with additional works created and performed by graduate and undergraduate students. Students work closely with renowned artists and companies who visit the campus annually and with researchers in the areas of dance science, dance in relation to technology, dance music composition, labanotation, sound, and video production. ASU students and faculty have consistently taken top honors at the regional and national festivals of the American College Dance Festival Association.

School of Music. Ranked among the top programs in the United States, the School of Music offers a broad scope of degree options for the study of performance, music education, music therapy, composition, theory, history and literature, jazz, music theatre, ethnomusicology, pedagogy, accompanying, and conducting. This wide spectrum of areas is supported by special programs and facilities that enrich the opportunities for professional training and musical growth. Music education and pedagogy are supplemented by the Piano and Guitar Preparatory Programs, the Music for Tots series, special classes for certification in Orff and Kodály methods, and the publication on campus of a major research journal. Performance opportunities are enhanced by a wide variety of ensembles, including such groups as Mexican marimba, African drumming, and mariachi. Voice students may pursue training in opera or in Broadway musicals. Composition students work in the Electronic Music Studio, and all benefit from the Electronic Classroom, a state-of-the-art computer facility. A variety of community partnerships, including a gang intervention program, stem from the music therapy area. The scope and

variety of the School of Music's programs are made possible by the wide range of expertise of the faculty, who are performers, teachers, conductors, composers, and scholars recognized both nationally and internationally.

Department of Theatre. The Department of Theatre's B.A. degree features a broad liberal arts education, which cultivates in the student the ability to understand human behavior and values in societies of the past and present, an essential element in the creation of and response to theatre. Students interested in theatre education enroll in a B.F.A. degree program designed to allow work in both the Department of Theatre and the College of Education. Special strengths of the department include internationally acclaimed programs in theatre education and theatre for youth; an outstanding playwriting area that infuses each specialization with new script work; multiethnic courses and programs in acting and directing; an acting program that allows work with nationally acclaimed directors and acting coaches; and a nationally recognized scenography area that provides for further specialization in costume, lighting, or scene design as well as theatre technology.

Production is at the core of ASU theatre and the quality of the faculty, student body, and facilities often attracts professionals to ASU. The department recently premiered productions by three Pulitzer prize-winning playwrights. Four to six subscription series plays are produced in the 500-seat Galvin Playhouse and the smaller Lyceum Theatre. An additional eight to 14 student-directed shows are presented.

Theatre-for-youth artists, students, and scholars are attracted to ASU by the opportunities to work on national K-12 theatre curricula and research projects, theatre tours to area schools, and opportunities to teach on and off campus. The Child Drama Special Collection in Hayden Library, which includes rare books, plays, and personal and national association archives, is the most complete and extensive collection of its kind in the English-speaking world and also contributes to the international recognition of the theatre-for-youth faculty.

A faculty playwright works closely with both undergraduate and graduate directing students to create and showcase original scripts from students and faculty. An interdisciplinary M.F.A. degree in Creative Writing encourages graduate students to work closely with writers of drama, fiction, and poetry and with directors and producers from the Departments of English and Theatre. Faculty in the Departments of Theatre and English offer students a unique opportunity to tailor a course of study to fit individual needs, talents, and goals.

ASU EXTENDED CAMPUS

The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges, including the Katherine K. Herberger College of Fine Arts, to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning.

For more information, see "ASU Extended Campus," page 683, or access the Web site at www.asu.edu/xed.

GENERAL INFORMATION

Undergraduate Credit for Graduate Courses. To enable interested students to benefit as much as possible from their undergraduate studies, the Graduate College and the Herberger College of Fine Arts extend to seniors with a GPA of at least 2.50 the privilege of taking 500-level graduate courses for undergraduate credit. Students requesting to take 500-level graduate courses must have the approval of the instructor of the class and their academic advisor.

Preprofessional Programs. Students preparing for admission to professional graduate schools should obtain information regarding admission requirements by writing directly to the schools in which they are interested.

Courses. The academic units within the Herberger College of Fine Arts may use the CFA prefix for course offerings that cross disciplinary boundaries.

COLLEGE OF FINE ARTS (CFA)

CFA 194 Special Topics. (1-4)

fall

Possible topics:

(a) Academic Balance for the Fine Arts Major. (1)

CFA 422 Concepts in Collaborative Multimedia. (3)

spring

Designed to bring students from different disciplines throughout the Herberger College of Fine Arts to experience the collaboration process in creating art. Lab, studio.

CFA 484 Internship. (1-12)

fall and spring

CFA 494 Special Topics. (3)

fall and spring

CFA 498 Pro-Seminar. (1-7)

fall and spring

CFA 522 Concepts in Collaborative Multimedia. (3)

spring

Designed to bring students from different disciplines throughout the Herberger College of Fine Arts to experience the collaboration process in creating art. Lab, studio.

CFA 584 Internship. (1-12)

fall and spring

CFA 594 Special Topics. (3)

fall and spring

CFA 684 Internship. (1-12)

fall and spring

CFA 784 Internship. (1-12)

fall and spring

School of Art

Julie F. Codell
Director
 (ART 102) 480/965-3468
 herbergercollege.asu.edu/art

REGENTS' PROFESSOR WEISER

PROFESSORS

ALQUIST, BATES, BRITTON, CODELL, ECKERT,
 ERICKSON, FAHLMAN, FRONSKE, GASOWSKI,
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ASSOCIATE PROFESSORS

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 MARC, PESSLER, PITTSLEY, SCHLEIF, SCHOBEL,
 SCHUTTE, SEGURA, SERWINT, UMBERGER,
 VERSTEGEN, WOLFFHAL

ASSISTANT PROFESSORS

BROWN, McIVER

SENIOR LECTURERS

HOKIN, SARDI

All students registering in a School of Art degree program enroll through the Herberger College of Fine Arts. Each degree program and area of specialization has its own check sheet, which describes the particulars of course sequence and special requirements. Check sheets are available in the School of Art Undergraduate Advising office.

ART—B.A.

The faculty in the School of Art offer four concentrations for students in the B.A. degree in Art program: art history, digital arts, museum studies, and studio art. These concentrations are intended to give the student a broadly based general education in the field with some specialized work at the upper-division level.

The major in Art consists of 45 to 79 semester hours, depending on the concentration, and includes the requirements listed on this page for each concentration. B.A. degree programs are especially suited for individuals pursuing interdisciplinary studies or a minor in another discipline. All courses in the major must be completed with a "C" or higher.

Students who petition to complete both B.A. and B.F.A. degrees in Art must declare different areas of specialization.

Graduation Requirements. In addition to fulfilling the major requirements, students must meet all university graduation requirements and college degree requirements. See "University Graduation Requirements," page 74, and "College Degree Requirements," page 267.

Art History

This concentration consists of a minimum of 45 semester hours as approved by the student's advisor. It requires 33 semester hours of art history and 12 semester hours in related fields. At least 27 of the 45 semester hours must be upper-division credit. Satisfactory completion of ARS 480 Research Methods is required before the senior year.

Art History Requirements

ARS 101 Art of the Western World I <i>HU, H</i>	3
ARS 102 Art of the Western World II <i>HU, H</i>	3
ARS 480 Research Methods <i>L</i>	3
ARS 498 PS: Art History.....	3
Total	12

Also required is at least one art history course from each of the following areas:

Ancient.....	3
Baroque.....	3
Medieval.....	3
Modern.....	3
Non-Western.....	3
Renaissance.....	3

Related Subject Field. Select three courses (nine semester hours) from those with the prefix APH, ARA, ARE, or from the following:

ART 111 Drawing I.....	3
ART 112 Two-Dimensional Design	3
ART 113 Color	3
ART 115 Three-Dimensional Design	3
ART 201 Photography I.....	3
ART 260 Ceramics for Nonmajors	3
ART 274 Wood I.....	3
ART 294 Special Topics	3

Also required is an approved upper-division elective. Six semester hours of ART courses are recommended.

Foreign Language. Demonstrated proficiency in at least one foreign language is required, equivalent to the level obtained through the completion of two years of study at the college level. For specific courses, see the "Department of Languages and Literatures," page 384. (SHS courses are not acceptable.)

Digital Arts

For more information about the concentration in digital arts, contact the school.

Museum Studies

A minimum of 63 hours is required for the museum studies concentration. This concentration is an interdisciplinary program. It involves courses and the cooperation of the Department of Anthropology, Center for the Advancement of Small Business, American Humanics/Department of Recreation Management, and the Department of Languages and Literatures.

Specialization

ARS 101 Art of the Western World I <i>HU, H</i>	3
ARS 102 Art of the Western World II <i>HU, H</i>	3
ARS 201 Art of Asia <i>HU, G, H</i>	3
ARS 202 Art of Africa, Oceania, and the Americas <i>HU, G, H</i>	3
ARS 480 Research Methods <i>L</i>	3

ARS 484 Internship (Museum).....3
 ARS 494 ST: Introduction to Museums3
 or ASB 471 Introduction to Museums (3)
 Upper-division ARS course3
 ART 409 Photographic Exhibition3
 or ARA 460 Gallery Exhibitions (3)

Business

COB 380 Small Business Leadership3
 COB 381 Small Business Accounting.....3
 COB 382 Small Business Sales and Marketing Development.....3

Foreign Language. Demonstrated proficiency in at least one foreign language is required, equivalent to the level obtained through the completion of two years of study at the college level. For specific courses, see the “Department of Languages and Literatures,” page 384. (SHS courses are not acceptable.)

Major Electives. Select a minimum of 12 hours from the following:

1. Anthropology
2. Art History
3. Business
4. History
5. REC 300 Fund Raising
6. REC 310 Volunteerism

Studio Art

Core Curriculum. The following courses make up the core curriculum:

ARS 101 Art of the Western World I *HU, H*3
 ARS 102 Art of the Western World II *HU, H*3
 ART 111 Drawing I3
 ART 112 Two-Dimensional Design3
 ART 113 Color3
 ART 115 Three-Dimensional Design3
 Total18

Specialization. Eighteen semester hours (including 12 hours of upper-division study) of ART focus courses must be selected from the following areas: ceramics, drawing, fibers, intermedia, metals, painting, photography, printmaking, and sculpture.

Art History. Nine semester hours of ARS courses are required, which must include three semester hours of non-Western art. At least six semester hours must be upper-division ARS courses.

Related Subject Area. Related subject area includes courses outside the area of specialization in the School of Art, Herberger College of Fine Arts, and the university. Course selection must be related to student’s professional goals in art and approved by area of specialization faculty and an academic advisor. A minimum of 24 hours is required, of which 18 hours must be of upper-division study.

Art History Minor

The School of Art offers a minor in Art History consisting of 18 semester hours of course work, including 12 upper-

division electives. A minimum grade of “C” is required of all classes in the minor and for those pursuing a minor, a minimum overall GPA of 2.00 is required. Courses may not be double counted in a major and the minor, and a minimum of 12 hours of resident credit at ASU Main is required.

ARS 100 or 300 may be used toward a minor. ARS 100 and 300 may not be used toward an Art History minor if the student is an Art major or has credit in ARS 101 and 102.

Required Courses. Select two of the following four required courses:

ARS 101 Art of the Western World I *HU, H*3
 ARS 102 Art of the Western World II *HU, H*3
 ARS 201 Art of Asia *HU, G, H*3
 ARS 202 Art of Africa, Oceania, and the Americas *HU, G, H*.....3

Elective Courses. Students pursuing an art history minor select four three-semester-hour upper-division courses. A seminar is strongly recommended for those considering graduate study. Students need to be aware of lower-division prerequisites for all upper-division courses. Interested students should contact the School of Art for specific requirements and admission procedures.

ART—B.F.A.

The major in Art consists of 75 semester hours, with a concentration in one area selected on the basis of the student’s interests. The following concentrations are available to the student: art education, ceramics, drawing, fibers, intermedia, metals, painting, photography, printmaking, and sculpture.

B.F.A. Core Curriculum. All students in this degree program follow the same core curriculum in art for the first two semesters:

ARS 101 Art of the Western World I *HU, H*3
 ARS 102 Art of the Western World II *HU, H*3
 ART 111 Drawing I3
 ART 112 Two-Dimensional Design3
 ART 113 Color3
 ART 115 Three-Dimensional Design3
 Total18

At least 30 upper-division semester hours must be earned within the major, with a minimum of 12 semester hours within the concentration.

All course work counted in the major must be completed with a “C” or higher. The specific requirements for each concentration are recommended by the faculty advisors of the area and are listed on School of Art check sheets.

Courses from other departments, when approved by the advisor and the School of Art, may be applied to the major if deemed appropriate to the student’s program of study. Art courses that do not have the same title and description as ASU catalog courses must have the approval of the School of Art Standards Committee.

Students who petition to have two B.F.A.s in Art must complete at least 21 hours of different course work in the areas of specialization.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Graduation Requirements. In addition to fulfilling the major requirements, students must meet all university graduation requirements and college degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 267.

Art Education

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ARE 440 Disciplines of Art Education.....	3
ARE 450 Teaching Inquiry in Art.....	3
ARE 470 Art Criticism: Aesthetics.....	3
ARE 482 Teaching Art Processes.....	3
ARE 486 Art Education: Strategies and Applications.....	3
ARE 494 Special Topics.....	3
ARE 496 Methods and Assessment of Learning in Art.....	3
Total.....	21

Area of Proficiency. Twenty-one semester hours are required with a minimum of 15 semester hours in a specific area of studio art or art history. Twelve of these semester hours must be upper-division credits.

Art History. Six semester hours of ARS upper-division courses are required. One course must be a 20th-century ARS course. Non-Western art is recommended for the second course.

Additional Requirements. The following courses are additional requirements:

ART 201 Photography I.....	3
ART 223 Painting I.....	3
ART 231 Sculpture I.....	3
or ART 261 Ceramic Survey (3)	
or ART 272 Jewelry I (3)	
or ART 274 Wood I (3)	
or ART 276 Fibers I (3)	
Total.....	9

The concentration in art education consists of 75 semester hours with 21 semester hours in art education and 21 semester hours in an art proficiency approved by an art education advisor. The art proficiency courses must include a minimum of 15 semester hours in a specific area of studio art or art history. Twelve of these semester hours must be upper-division credits. The art proficiency can be in art history, ceramics, drawing, fibers, intermedia, metals, painting, photography, printmaking, or sculpture. Teaching experience is provided in the Children’s Art Workshop, which is an on-campus program based in studio art and art history for children ages five to 15. Participation in the workshop is part of the requirements for ARE 486 Art Education: Strategies and Applications. ARE 486 meets the state certification requirements for the elementary methods class, and ARE 496 Methods and Assessment of Learning in Art meets the requirements for the secondary methods class in the subject area. Both of these courses have prerequisites.

A student pursuing a B.F.A. degree in Art with a concentration in art education may also choose to become certified for teaching art K–12. If certification is elected while pursuing the art education undergraduate degree, additional

semester hours are required in the College of Education. Students must make special application to the professional education program in the College of Education three months before the beginning of the junior year. To be considered for admission to the professional program, students must have successfully completed the Pre-Professional Skills Test (PPST) or the ACT during the sophomore year. In addition, as part of the certification process, students must meet the U.S. and Arizona constitution requirement. Certification may also be pursued after receiving an undergraduate degree in art through the postbaccalaureate program in the College of Education. Interested students should contact an advisor in the College of Education and in art education for admission requirements to the postbaccalaureate program. Art education courses for this program are as follows:

ARE 450 Teaching Inquiry in Art.....	3
ARE 482 Teaching Art Processes.....	3
ARE 486 Art Education: Strategies and Applications.....	3
ARE 496 Methods and Assessment of Learning in Art.....	3
Total.....	12

The B.F.A. degree in Art with a concentration in art education and the postbaccalaureate program for certification in art has a special art education application procedure. This procedure is separate from, and in addition to, the admission requirements of ASU. Acceptance is based on a 2.50 GPA, completion of foundations courses (ART 111, 112, 113, and 115), completion of 12 semester hours of art history courses (ARS 101 and 102 and two upper-division courses), and a “B” or higher in ARE 440 and 450. In addition, undergraduate and postbaccalaureate students seeking K–12 certification should check requirements and deadlines for admission to the College of Education professional program.

Student teaching in art education occurs only in the spring semester. To be accepted into student teaching, a student must be recommended in writing by the art education faculty and must have completed all art education classes except for ARE 496, which should be taken concurrently with student teaching. Students who are not recommended may complete the B.F.A. degree in Art with a concentration in art education without certification or may reapply after meeting deficiencies in knowledge and skills related to the teaching of art.

Ceramics

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 360 Ceramic Throwing.....	3
ART 364 Ceramic Handbuilding I.....	3
ART 365 Ceramic Handbuilding II.....	3
ART 460 Ceramic Clay.....	3
ART 463 Ceramic Glaze.....	3
ART 466 Special Problems in Ceramics.....	6
Total.....	27

Art History. Six semester hours of upper-division ARS courses, including a 20th-century and a non-Western ARS course, are required.

Additional Requirements. One of the following four courses is required:

ART 211 Drawing II.....	3
ART 214 Life Drawing I.....	3
ART 227 Watercolor I.....	3
ART 443 Intermedia.....	3

Two of the following three courses (six semester hours) are required:

ART 272 Jewelry I.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Art Electives. Fifteen semester hours of ARA, ARE, ARS, and ART courses are required.

Drawing

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 211 Drawing II.....	3
ART 214 Life Drawing I.....	3
ART 223 Painting I.....	3
ART 227 Watercolor I.....	3
ART 311 Drawing III.....	3
ART 314 Life Drawing II.....	3
ART 315 Life Drawing III.....	3
ART 411 Advanced Drawing.....	3
Total.....	24

Also required are six semester hours of ART 411, 414, or 494 drawing, painting, or printmaking (three semester hours).

Art History. Nine semester hours, including six semester hours of upper-division and three semester hours of non-Western ARS courses, are required.

Additional Requirements. Two of the following six courses (six semester hours) are required:

ART 201 Photography I.....	3
ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Art Electives. Nine semester hours of ARA, ARE, ARS, or ART courses are required.

Fibers

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 276 Fibers I.....	3
ART 376 Fibers: Loom Techniques.....	3
ART 377 Surface Design.....	3

ART 476 Fibers: Multiple Harness Weaving.....	6
ART 477 Printed Textiles.....	6
Total.....	21

Art History. Six semester hours of upper-division ARS courses are required, including a 20th-century elective.

Additional Requirements. Three of the following six courses (nine semester hours) are required:

ART 201 Photography I.....	3
ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 274 Wood I.....	3

Art Electives. Twenty-one semester hours of ARA, ARE, ARS, and ART courses are required.

Intermedia

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. To enroll in intermedia area of specialization courses (i.e., ART 345, 346, 348, 439, 440, 441, 470, 449, 450, 484 [intermedia], 494 [intermedia], 499 [intermedia]) students must be accepted through a portfolio review and have a minimum 2.50 GPA. Students must indicate an intermedia curriculum focus as part of the application. The application deadlines are October 15 for spring classes and March 15 for fall classes. The guidelines for applying are available in ART 151 and at herbergercollege.asu.edu/art.

The following courses make up the specialization:

Select three semester hours from the following:

ART 439 Mixed Media.....	3
ART 442 Folk/Outsider Art.....	3
ART 443 Intermedia.....	3
ART 494 ST: Nonelectronic Intermedia.....	3

Select three semester hours from the following:

ART 345 Visualization and Prototyping I.....	3
ART 346 3D Computer Imaging and Animation CS.....	3
ART 348 Computer Animation I.....	3
ART 440 New Media Concepts.....	3
ART 441 Video Art.....	1
ART 449 Computer Animation and Video.....	3
ART 450 Computer Animation and Audio.....	3
ART 494 ST: Digital.....	3

The remaining 12–13 hours may be taken from the above areas of specialization requirements with the approval of a faculty intermedia advisor for the curriculum focus within intermedia.

ART 345 Visualization and Prototyping I.....	3
ART 346 3D Computer Imaging and Animation CS.....	3
ART 348 Computer Animation I.....	3
ART 439 Mixed Media.....	3
ART 440 New Media Concepts.....	3
ART 441 Video Art.....	1
ART 443 Intermedia.....	3
ART 449 Computer Animation and Video.....	3
ART 450 Computer Animation and Audio.....	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

ART 494 ST: Digital.....	3
ART 494 ST: Nonelectronic Intermedia.....	3

Intermedia-Related Study

Two of the following courses (six semester hours) are required:

ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Two of the following courses (six semester hours) are required:

ART 201 Photography I.....	3
ART 211 Drawing II.....	3
ART 223 Painting I.....	3
ART 227 Watercolor I.....	3
ART 351 Intaglio I.....	3
ART 352 Lithography I.....	3
ART 354 Screen Printing I.....	3
ART 355 Photo Process for Printmaking I.....	3

Art History. Nine semester hours, including three hours of non-Western, and six hours of 20th-century and/or contemporary art ARS courses, are required. Six hours must be in the upper division.

Art Electives. Seventeen to eighteen semester hours of ARA, ARE, ARS, and ART courses are required. Photo history is recommended.

The deadline for submitting review materials to enroll in computer animation courses is March 15 for fall semester and October 15 for spring semester.

Metals

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 272 Jewelry I.....	3
ART 372 Jewelry II.....	3
ART 373 Metalworking I.....	3
ART 472 Advanced Jewelry.....	6
ART 473 Advanced Metalworking.....	6
ART 494 ST: Metals.....	3
Total.....	24

Art History. Six semester hours of upper-division ARS courses are required, including a 20th-century elective.

Additional Requirements. Three of the following six courses (nine semester hours) are required:

ART 201 Photography I.....	3
ART 223 Painting I.....	3
ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Art Electives. Eighteen semester hours of ARA, ARE, ARS, and ART courses are required.

Painting

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 211 Drawing II.....	3
ART 214 Life Drawing I.....	3
ART 223 Painting I.....	3
ART 227 Watercolor I.....	3
ART 311 Drawing III.....	3
ART 314 Life Drawing II.....	3
ART 323 Painting II.....	3
ART 324 Painting III.....	3
or ART 327 Watercolor II (3)	
ART 325 Figure Painting.....	3
ART 423 Advanced Painting.....	3
or ART 427 Advanced Watermedia (3)	

Total.....30

One of the following six courses (three semester hours) is required:

ART 324 Painting III.....	3
ART 327 Watercolor II.....	3
ART 411 Advanced Drawing.....	3
ART 423 Advanced Painting.....	3
ART 425 Advanced Figure Painting.....	3
ART 494 ST: Drawing.....	3
or ART 494 ST: Painting (3)	

Art History. Nine semester hours of ARS courses are required, including three hours of non-Western. Six hours must be upper-division ARS courses.

Additional Requirements. Two of the following six courses (six semester hours) are required:

ART 201 Photography I.....	3
ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Art Electives. Nine semester hours of ARA, ARE, ARS, and ART courses are required.

Photography

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ARA 202 Understanding Photographs.....	3
ART 201 Photography I.....	3
ART 301 Photography II.....	3
ART 304 Advanced Photography.....	3
Total.....	12

Three of the following ten courses (nine semester hours) are required:

ART 305 Color Photography I.....	3
ART 401 Nonsilver Photography.....	3
ART 403 Senior Photographic Projects.....	3
ART 404 Portraiture Photography.....	3
ART 405 Advanced Color Photography.....	3

ART 406 Photo Techniques	3
ART 407 View Camera.....	3
ART 408 Digital Photographic Images.....	3
ART 409 Photographic Exhibition	3
ART 494 ST: Photo.....	3

Art History. ARS 450 and 451 are required, as well as six semester hours of additional ARS courses, including a non-Western elective.

Additional Requirements. Select one of the following courses:

ART 211 Drawing II.....	3
ART 214 Life Drawing I.....	3
ART 223 Painting I.....	3
ART 227 Watercolor I.....	3

One of the following five courses (three hours) is required:

ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Art Electives. Eighteen semester hours of ARA, ARE, ARS, and ART courses are required.

Printmaking

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 211 Drawing II.....	3
or ART 214 Life Drawing I (3)	
ART 351 Intaglio I.....	3
ART 352 Lithography I.....	3
ART 354 Screen Printing I.....	3
Total	12

Three of the following ten courses (nine semester hours) are required:

ART 253 Introduction to Printmaking	3
ART 355 Photo Process for Printmaking I.....	3
ART 451 Advanced Intaglio.....	3
ART 452 Advanced Lithography.....	3
ART 454 Advanced Screen Printing.....	3
ART 455 Advanced Photo Processes for Printmaking.....	3
ART 456 Fine Printing and Bookmaking I.....	3
ART 457 Fine Printing and Bookmaking II	3
ART 458 Papermaking	3
ART 459 Monoprinting	3

Two of the following five courses (six semester hours) are required:

ART 214 Life Drawing I.....	3
ART 311 Drawing III.....	3
ART 314 Life Drawing II.....	3
ART 315 Life Drawing III.....	3
ART 411 Advanced Drawing	3

Art History. Six semester hours of upper-division ARS courses are required.

Additional Requirements. Two of the following eight courses (six semester hours) are required:

ART 201 Photography I.....	3
ART 223 Painting I.....	3
ART 227 Watercolor I.....	3
ART 231 Sculpture I.....	3
ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 274 Wood I.....	3
ART 276 Fibers I.....	3

Art Electives. Eighteen semester hours of ARA, ARE, ARS, and ART courses are required.

Sculpture

Core Curriculum. See “B.F.A. Core Curriculum,” page 271, for the courses that make up the core curriculum.

Specialization. The following courses make up the specialization:

ART 223 Painting I.....	3
ART 231 Sculpture I.....	3
ART 274 Wood I.....	3
ART 331 Sculpture II.....	3
ART 332 Sculpture III.....	3
ART 431 Special Problems in Sculpture	3
Total	18

Four of the following nine courses (12 semester hours) are required (note that all are repeatable except ART 333):

ART 333 Foundry Casting Methods.....	3
ART 374 Wood II	3
ART 431 Special Problems in Sculpture	3
ART 432 Neon Sculpture.....	3
ART 436 Architectural Sculpture	3
ART 437 Film Animation.....	3
ART 438 Experimental Systems in Sculpture	3
ART 474 Advanced Wood.....	3
ART 494 Special Topics in Sculpture.....	3

Art History. Six semester hours of upper-division ARS courses are required.

Additional Requirements. Two of the following three courses are required:

ART 261 Ceramic Survey.....	3
ART 272 Jewelry I.....	3
ART 276 Fibers I.....	3

Art Electives. Fifteen semester hours of ARA, ARE, ARS, and ART courses are required.

GRADUATE PROGRAMS

The faculty in the School of Art offer programs leading to the M.A. degree in Art, with a concentration in art education or art history, the Master of Fine Arts degree with a concentration in ceramics, drawing, fibers, intermedia, metals, painting, photographic studies, photography, printmaking, sculpture, or wood, and a Ph.D. degree in History and

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Theory of Art. In cooperation with the College of Education, the Doctor of Education degree is offered with a concentration in art education. See the *Graduate Catalog* for requirements for all graduate degrees.

ART AUXILIARY (ARA)

ARA 202 Understanding Photographs. (3)

once a year

Slide lecture course in understanding photography as a fine art form.

ARA 311 Art Appreciation and Human Development. (3)

fall

Foundations of art for children and young adults. Emphasis on learning, development, and understanding art in historical and cultural contexts. Lecture, discussion. Prerequisites: ENG 101, 102; junior standing.

General Studies: HU

ARA 460 Gallery Exhibitions. (3)

fall and spring

Practical experience in all phases of department gallery operations and preparation of gallery publications. May be repeated for credit. Prerequisite: instructor approval.

ARA 488 Understanding Art. (3)

fall and spring

Understanding art as an emergent cultural phenomenon with an emphasis on a critical examination of conceptual issues in art. Writing required. Prerequisites: both ARS 101 and 102 or only instructor approval.

General Studies: L/HU

ARA 494 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) Advanced Photo Aesthetics. (3)

ART EDUCATION (ARE)

ARE 301 Studio Art and Human Development. (3)

once a year

Study of human development in studio art from early childhood to adult years.

ARE 440 Disciplines of Art Education. (3)

once a year

Explorations in art education's disciplines, history, and people's art-making development at diverse age levels and abilities. Lecture, discussion. Prerequisites: a combination of ARS 101 and 102 and ARS 113 and 115 or only instructor approval.

ARE 450 Teaching Inquiry in Art. (3)

fall and spring

Designing inquiry-based curriculum units built on developmental levels of art making and art understanding. Lecture, discussion. Prerequisites: ARS 101, 102.

ARE 470 Art Criticism: Aesthetics. (3)

fall

Traditions of aesthetics and art criticism; conceptual issues in contemporary art; education in the visual arts. Prerequisite: ARE 440 or instructor approval.

ARE 482 Teaching Art Processes. (3)

spring

Art traditions of the 20th century as a basis for studio and art history instruction. 2 hours lecture, 2 hours studio. Meets art postbaccalaureate certification requirement. Prerequisite: ARE 450.

ARE 486 Art Education: Strategies and Applications. (3)

fall

Implementation and evaluation of art instruction for K–12 population. Includes teaching of Saturday classes in the Children's Art Workshop. Meets art postbaccalaureate certification requirement. Prerequisite: ARE 482.

ARE 494 Special Topics. (3)

once a year

ARE 496 Methods and Assessment of Learning in Art. (3)

once a year

Individual or group research on the assessment of art learning incorporating theory and practice. Meets art postbaccalaureate certification requirement. Prerequisites: both ARE 470 and 486 or only instructor approval.

ARE 510 Art Education Colloquium. (3)

not regularly offered

Historical foundations of art education and faculty presentations regarding teaching and research related to the visual arts.

ARE 520 Issues in Teaching Inquiry in Art. (3)

once a year

Issues in teaching and learning through inquiry about artworks using print and electronic reproductions and information. Recommended to be taken before ARE 525.

ARE 525 Research on Teaching Art History. (3)

once a year

Review of empirical and historical research, research methods, learning theory, and assessment of learning in art history. Pilot studies on the effects of instruction upon learning. Recommended to be taken after ARE 520.

ARE 530 Issues in Teaching Studio Art. (3)

once a year

Critical examination of issues concerning teaching multicultural art to different populations of students. Historical and philosophical foundations reviewed. Recommended to be taken before ARE 535. Lecture, discussion.

ARE 535 Research on Teaching Studio Art. (3)

once a year

Review of empirical and historical research methods, learning theory, and assessment of learning in studio art, including developmental studies and their limitations. Pilot studies on the effects of instruction upon learning. Recommended to be taken after ARE 530.

ARE 540 Teaching Art in Cultural Contexts. (3)

once a year

Relationship of multicultural perspectives to teaching/learning art criticism, aesthetics, studio art, and art history.

ARE 610 Issues and Trends in Art Education. (3)

not regularly offered

Doctoral-level investigation of historical and contemporary issues related to teaching and research in art education.

ARE 611 Curriculum Development in Art Education. (3)

not regularly offered

Doctoral-level inquiry into the philosophical, psychological, and sociological foundations of curriculum development.

ART HISTORY (ARS)

ARS 100 Introduction to Art. (3)

fall, spring, summer

Understanding of art and its relationship to everyday life through painting, sculpture, architecture, and design. No credit for Art majors or students who have completed ARS 101 or 102 or 300.

General Studies: HU

ARS 101 Art of the Western World I. (3)

fall, spring, summer

History of Western art from the Paleolithic period through the Middle Ages.

General Studies: HU, H

ARS 102 Art of the Western World II. (3)

fall, spring, summer

History of Western art from the Renaissance to the present.

General Studies: HU, H

ARS 201 Art of Asia. (3)

once a year

History of the art of the Asian cultures, with emphasis on China, Japan, and India. Meets non-Western art history requirement.

General Studies: HU, G, H

ARS 202 Art of Africa, Oceania, and the Americas. (3)

spring

History of art of Africa, Oceania, and the New World. Meets non-Western art history requirement. Credit is allowed for only ARS 202 or 302. Cross-listed as AFH 202. Credit is allowed for only AFH 202 or ARS 202.

General Studies: HU, G, H

ARS 250 History of Photography. (3)

once a year

History of photography from the 19th century to the present.

General Studies: HU

ARS 300 Introduction to Art. (3)*fall and spring*

Course content same as ARS 100 but requires a higher level of accomplishment and comprehension. No credit for students who have completed ARS 100 or used as art history credit by Art majors.

*General Studies: HU***ARS 302 Art of Africa, Oceania, and the Americas. (3)***once a year*

History of art of Africa, Oceania, and the New World. Meets non-Western art history requirement. Credit is allowed for only ARS 302 or 202. Prerequisites: ARS 101, 102.

*General Studies: HU, G, H***ARS 310 The Renaissance in Tuscany. (3)***summer*

Course taught in Florence, Italy. History of arts in Tuscany with focus on city of Florence from 14th through 16th centuries. Completion of ARS 101 and 102 suggested. Lecture, tours.

ARS 340 Art in America. (3)*once a year*

American art from colonial times through the Second World War. Not available to students who have completed ARS 444, 542, or 543. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 384 Art History Internships. (3)***once a year*

Institutionally based practicum within an art museum or professional visual arts organization. Internship.

ARS 400 History of Printmaking. (3)*once a year*

History of the print as an art form and its relation to other modes and forms of artistic expression. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 402 Art of Ancient Egypt. (3)***not regularly offered*

Aesthetic, philosophical, and cultural basis of Egyptian art from pre-Dynastic period through New Kingdom. Emphasis on sculpture and architectural monuments. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 404 Greek Art. (3)***once a year*

History of art, architecture of Aegean civilizations (Cycladic, Minoan, Mycenaean) and of Greece to end of Hellenistic period. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 406 Roman Art. (3)***once a year*

Art and architecture of Etruria, the Roman Republic, and the Roman Empire. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 410 Early Christian and Byzantine Art. (3)***once a year*

Art and architecture of the early church and the Byzantine Empire from the 4th to the 15th century. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 412 Early Medieval Art. (3)***not regularly offered*

Painting, sculpture, architecture, and the minor arts from Migration, Carolingian, and Ottonian periods considered within religious, social, and economic contexts. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 414 Romanesque Art. (3)***once a year*

Sculpture, painting, architecture, and minor arts in western Europe, ca. 1030–1200, considered within religious, economic, and social contexts. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 416 Gothic Art. (3)***once a year*

Painting, sculpture, and architecture in western Europe during the Gothic period. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 417 Late Gothic Art in Central Europe. (3)***not regularly offered*

Sculpture, painting, and architecture of the late-Gothic style, ca. 1350–1525, considered within religious, social, economic, and political contexts. Prerequisites: both ARS 101 and 102 or only instructor approval.

ARS 418 Renaissance Art in Northern Europe. (3)*once a year*

Graphics, painting, sculpture, and architecture, ca. 1450–1550. Reformation themes and Renaissance style considered within religious, political, social, and economic contexts. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 420 Early Renaissance Art in Italy. (3)***not regularly offered*

Painting, sculpture, and architecture in Italy from 1300 to 1500. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 422 Italian High Renaissance Art and Mannerism. (3)***once a year*

History of Italian art during the 16th century, including the achievements and influence of Leonardo da Vinci, Raphael, and Michelangelo. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 424 Italian Baroque Art. (3)***once a year*

Italian painting, sculpture, and architecture of the 17th century. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 426 Art of the 17th Century in Northern Europe. (3)***once a year*

Baroque painting, sculpture, and architecture in Flanders, the Netherlands, France, and England. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 428 Art of the 18th Century. (3)***once a year*

History of painting, sculpture, architecture, graphic arts, and the decorative arts from 1700 to the French Revolution (1789). Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 430 Art of Spain and Its Colonies. (3)***once a year*

Architecture, painting, and sculpture from 1500 to 1800. Colonial focus on central Mexico and the American Southwest. Prerequisite: ARS 102 or instructor approval.

*General Studies: HU, H***ARS 432 19th-Century French Art and Culture. (3)***fall*

History of painting, graphic arts, sculpture, and architecture, 1800 to 1900 in France in its political, social, and economic contexts. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 434 From Courbet to Cézanne: History of European Art 1860–WWI. (3)***spring*

Aesthetic, political, and social forces affecting the visual arts in the late 19th century. Concentration on cubism, expressionism, impressionism, and postimpressionism. Prerequisites: both ARS 101 and 102 or only instructor approval.

General Studies: HU

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

ARS 436 Art at the Turn of the Century: 1885–1914. (3)*fall*

History of European avant-garde movements. Concentration on postimpressionism, symbolism, expressionism, and cubism. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 438 Art of the 20th Century I. (3)***once a year*

Developments and directions in art between 1900 and World War II. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 439 Art of the 20th Century II. (3)***once a year*

Art since World War II, with consideration of new concepts and experimentation with media and modes of presentation. Prerequisites: a combination of ARS 101 and 102 and 438 or only instructor approval.

*General Studies: HU, H***ARS 442 Critical Issues in American Painting I. (3)***once a year*

Explores themes and social issues in American art with a critical study of American painting from the 18th century to 1850. Lecture, discussion. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 443 Critical Issues in American Painting II. (3)***once a year*

Explores themes and social issues in American art with a critical study of American painting from 1850 to 1900. Lecture, discussion. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 444 Modern American Art, 1900–1945. (3)***once a year*

American painting, sculpture, photography, and architecture, 1900–1945. Covers major monuments, including the Eight, modernism, precisionism, regionalism, and the WPA. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 458 Critical Theories in the Visual Arts. (3)***not regularly offered*

Examines current critical theories through their application to all visual arts. May include new historicism, Marxism, deconstruction, post-structuralism, semiotics, Lacanian psychoanalysis, feminism, post-modernism. Lecture, discussion, student presentations. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 459 Writing Art Criticism. (3)***not regularly offered*

Traditional and contemporary approaches to the criticism of art. Students write critical essays. Latter half of the semester stresses the criticism of contemporary art in various media. Prerequisite: ARS 458 or instructor approval.

ARS 462 Pre-Columbian Art I. (3)*once a year*

Architecture, sculpture, ceramics, painting, and other arts of Mesoamerica before European contact. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 463 Pre-Columbian Art II. (3)***once a year*

Architecture, sculpture, ceramics, textiles, and other art of South America before European contact with focus on the Central Andes. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 465 Native North American Art. (3)***once a year*

Native American art forms of the United States and Canada from prehistoric times to the present. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 466 Native American Art of the Southwest. (3)***once a year*

American Indian art in the southwestern states from its origins to the present day. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, C, H***ARS 468 Art of the Arctic and Northwest Coast. (3)***not regularly offered*

Art associated with ceremony, shamanism, and daily life in the Arctic and on the Northwest Coast. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 469 Mexican Art. (3)***once a year*

Art of Mexico and related Central American cultures from the prehistoric to the contemporary schools. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU, H***ARS 472 Art of China. (3)***once a year*

Study of major forms in Chinese art: ritual bronze, sculpture, ceramic, calligraphy, painting, and architecture. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 473 Art of Japan. (3)***once a year*

Japanese art from the Jōmon period to the present. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 475 Chinese Painting. (3)***once a year*

From Ku K'ai-chin to Ch'i Pai-shih. Major artists, styles, and movements in Chinese painting. Meets non-Western art history requirement. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: HU***ARS 480 Research Methods. (3)***fall and spring*

Methodology and resource material for art historical research. Techniques of scholarly and critical writing and evaluation of bibliographic sources. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: L***ARS 484 Internship. (1–12)***not regularly offered***ARS 485 Women in the Visual Arts. (3)***spring*

Historical study of art by women in various media; related social, political, educational issues; representation of women in art. Lecture, discussion. Prerequisites: both ARS 101 and 102 or only instructor approval.

*General Studies: L***ARS 494 Special Topics. (1–4)***fall and spring*

Possible topics:

- (a) History of Photography. (3)
- (b) Introduction to Museums. (3)

ARS 498 Pro-Seminar. (1–7)*once a year*

Undergraduate seminar. Problems or criticism in possible topics:

- (a) American Art. (3–6)
- (b) American Indian Art. (3–6)
- (c) Ancient Art. (3–6)
- (d) Art History. (3–6)
- (e) Baroque Art. (3–6)
- (f) Chinese Art. (3–6)
- (g) Medieval Art. (3–6)
- (h) Modern Art. (3–6)
- (i) Photographic History. (3–6)
- (j) Pre-Columbian Art. (3–6)
- (k) Renaissance Art. (3–6)

Prerequisite: instructor approval.

ARS 501 Methodologies and Art History. (3)*fall*

History of the discipline and an exploration of various methodologies, critical theory, and bibliographies used by art historians. Seminar.

ARS 502 Critical Studies in Egyptian Art. (3)*not regularly offered*

Egyptian art from pre-Dynastic to New Kingdom periods. Focus on aesthetic, philosophical, and cultural contexts. Research paper and readings required.

ARS 504 Critical Approaches to Greek Art. (3)*once a year*

Art and architecture of Aegean civilizations (Cycladic, Minoan, Mycenaean) and of Greece to end of Hellenistic period. Research paper and readings required.

ARS 506 Critical Studies in Roman Art. (3)*once a year*

Art and architecture of Etruria, the Roman Republic, and the Roman Empire. Research paper and/or supplemental readings required.

ARS 514 Critical Approaches to Romanesque Art. (3)*not regularly offered*

Sculpture, painting, architecture, and the minor arts in western Europe, ca. 1030–1200, considered within religious, economic, and social contexts. Research paper required.

ARS 516 Critical Approaches to Gothic Art. (3)*not regularly offered*

Architecture, sculpture, painting, and the minor arts in western Europe, ca. 1150–1350, considered within religious, social, and economic contexts. Research paper required.

ARS 517 Critical Approaches to Late Gothic Art. (3)*not regularly offered*

Art of the late-Gothic style, ca. 1350–1525, considered within religious, social, economic, and political contexts. Research or reading project required.

ARS 522 Sixteenth-Century Italian Art. (3)*once a year*

Critical study of painting, sculpture, and architecture in 16th-century Italy in its religious and historical context.

ARS 528 Eighteenth-Century Art in Europe. (3)*once a year*

Critical study of European art from the late Baroque to the early years of Neoclassicism.

ARS 530 Art of Spain and New Spain. (3)*once a year*

Critical study of architecture, painting, and sculpture from 1500 to 1800. Lecture, conference.

ARS 532 Art, Politics, and Patronage, 1770–1850. (3)*fall*

Critical analyses of political events in Europe. Issues of patronage, art as propaganda examined. Impact of war and revolution on visual arts.

ARS 534 Studies in Modern European Art, 1850–1914. (3)*once a year*

Critical study of visual arts using primary source material from mid-19th century to WWI within philosophical, socioeconomic, and economic contexts. Lecture, tutorial. Prerequisite: instructor approval.

ARS 542 Critical Issues in American Painting I. (3)*once a year*

Explores themes and social issues in American art with a critical study of American painting from the 18th century to 1850. Lecture, discussion. Prerequisites: ARS 101, 102.

ARS 543 Critical Issues in American Painting II. (3)*once a year*

Explores themes and social issues in American art with a critical study of American painting from 1850 to 1900. Lecture, lab. Prerequisite: instructor approval.

ARS 544 American Modernism and Realism, 1900–1945. (3)*once a year*

Critical study of the social, political, and artistic changes in American art during the first half of the 20th century. Prerequisites: both ARS 101 and 102 or only ARS 340.

ARS 562 Art of Ancient Mesoamerica. (3)*fall*

Critical study of art and architecture of Mexico and Maya areas before Spanish contact. Lecture, conference.

ARS 565 Native Art of North America. (3)*once a year*

Critical examination of Native American art within culture, prehistory to the present. Prerequisites: both ARS 101 and 102 or only instructor approval.

ARS 574 Studies in Japanese Art. (3)*once a year*

Critical examination of the nature and history of Japanese art, its rich heritage and its indebtedness to foreign sources. Lecture, discussion. Prerequisites: both ARS 101 and 102 or only instructor approval.

ARS 575 Approaches to Chinese Painting. (3)*fall*

Critical history of Chinese painting from Eastern Chou to 1911. Emphasis on masters, regional developments, and conceptual underpinnings. Lecture, discussion. Prerequisites: both ARS 101 and 102 or only instructor approval.

ARS 591 Seminar. (1–12)*once a year*

Graduate seminar. Problems or criticism in possible topics:

- (a) American Art. (3–6)
- (b) American Indian Art. (3–6)
- (c) Ancient Art. (3–6)
- (d) Baroque Art. (3–6)
- (e) Chinese Art. (3–6)
- (f) Critical Theories in the Visual Arts. (3–6)
- (g) Medieval Art. (3–6)
- (h) Modern Art. (3–6)
- (i) Native American Art. (3–6)
- (j) Photographic History. (3–6)
- (k) Pre-Columbian Art. (3–6)
- (l) Renaissance Art. (3–6)

Prerequisite: instructor approval.

ARS 599 Thesis. (1–12)*not regularly offered***ART (ART)****STUDIO CORE CURRICULUM****ART 111 Drawing I. (3)***fall, spring, summer*

Fundamental, technical, and perceptual skills using common drawing media and their application to pictorial organization. 6 hours a week.

ART 112 Two-Dimensional Design. (3)*fall, spring, summer*

Fundamentals of pictorial design. 6 hours a week.

ART 113 Color. (3)*fall, spring, summer*

Principles of color theory as related to the visual arts. 6 hours a week. Prerequisites: ART 111, 112.

ART 115 Three-Dimensional Design. (3)*fall, spring, summer*

Fundamentals of 3D form. 6 hours a week. Fee. Prerequisites: ART 111, 112.

ART 294 Special Topics. (3)*fall and spring***CERAMICS****ART 260 Ceramics for Nonmajors. (3)***fall, spring, summer*

Handbuilding methods, wheel throwing, glaze and decorative processes, Raku, and stoneware firings. 6 hours a week. Fee.

ART 261 Ceramic Survey. (3)*fall, spring, summer*

Handforming methods, throwing on the wheel, decorative processes, and glaze application. 6 hours a week. Fee. Prerequisites: ART 112, 115.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ART 360 Ceramic Throwing. (3)*fall and spring*

Design analysis and production of functional pottery. Emphasis on throwing techniques, surface enrichment, and glaze application. 6 hours a week. May be repeated once for credit. Fee.

ART 364 Ceramic Handbuilding I. (3)*fall*

Search for form using handbuilding techniques. Kiln firing and related problems. Fee. Prerequisite: ART 261 or instructor approval.

ART 365 Ceramic Handbuilding II. (3)*spring*

Continuation of ART 364 with an additional focus on large-scale works, surface treatments, and glaze decoration with related kiln firing applications. Fee. Prerequisite: ART 364 or instructor approval.

ART 394 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Ceramics
Fee.
- (b) Turning
Fee.

ART 460 Ceramic Clay. (3)*spring*

Research into various clay body formulations, local natural materials, slip glazes, and engobes. Lecture, lab, studio. Fee. Prerequisites: both ART 360 and 364 or only instructor approval.

ART 463 Ceramic Glaze. (3)*fall*

Glaze calculation and formulation using various glaze colors and surfaces. Lecture, lab, studio. Fee. Prerequisite: ART 460 or instructor approval.

ART 466 Special Problems in Ceramics. (3)*fall, spring, summer*

Emphasis on personal expression within structure of seminars, critiques, and studio work. Professional methods of presentation/documentation of work. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 364 or instructor approval.

ART 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Ceramics Printmaking
Fee.
- (b) Turning
Fee.
- (c) Vapor Glazes
Fee.

ART 594 Conference and Workshop. (1–12)*not regularly offered*

Possible topics:

- (a) Turning
Fee.

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Ceramic Clay
Fee.
- (b) Ceramic Glaze
Fee.
- (c) Ceramics Printmaking
Fee.
- (d) Experimental Printmaking
Fee.
- (e) Special Problems in Ceramics
Fee.

DRAWING**ART 211 Drawing II. (3)***fall, spring, summer*

Continued development of technical and perceptual skills. Emphasis on materials and pictorial content. 6 hours a week. Prerequisites: ART 113, 115.

ART 214 Life Drawing I. (3)*fall, spring, summer*

Development of skill and expressiveness in drawing the basic form, construction, and gesture from the human figure. 6 hours a week. Fee. Prerequisites: ART 113, 115.

ART 311 Drawing III. (3)*fall and spring*

Emphasis on composition, exploration of drawing media. 6 hours a week. Prerequisites: ART 211, 214; instructor approval.

ART 314 Life Drawing II. (3)*fall and spring*

Drawing from the model with greater reference to structural, graphic, and compositional concerns. 6 hours a week. Fee. Prerequisite: ART 214 or instructor approval.

ART 315 Life Drawing III. (3)*fall and spring*

The human figure as the subject for drawing. Emphasis on conceptual alternatives and management of materials. 6 hours a week. Fee. Prerequisite: ART 314 or instructor approval.

ART 411 Advanced Drawing. (3)*fall and spring*

Visual and intellectual concepts through problem solving and independent study. Emphasis on the individual creative statement. 6 hours a week. May be repeated for credit. Prerequisites: ART 311; instructor approval.

ART 414 Advanced Life Drawing. (3)*fall and spring*

Various media and techniques on an advanced level. The human figure as an expressive vehicle in various contexts. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 315 or instructor approval.

ART 415 Art Anatomy. (4)*not regularly offered*

Study of human anatomical structures as applied to the practice of figure-oriented art. 3 hours lecture, 5 hours studio a week. Fee. Prerequisite: ART 214.

ART 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Drawing. (3)

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Art Anatomy
Fee.
- (b) Life Drawing
Fee.

FIBERS**ART 276 Fibers I. (3)***fall and spring*

Exploration of traditional and contemporary materials and basic techniques related to fibers. Embroidery, feltmaking, dyeing, block printing, plaiting, 3D structures. Fee. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 294 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Fibers for Nonmajors
Fee.

ART 376 Fibers: Loom Techniques. (3)*once a year*

Investigation of loom techniques and computer pattern design. 6 hours a week. Fee. Prerequisite: ART 113 or 115 or instructor approval.

ART 377 Surface Design. (3)*fall and spring*

Application of dyes and pigments on cloth exploring techniques, formal issues, and content. Cyanotype, monoprinting, painting on silk, resists, stenciling. Fee. Prerequisite: ART 276 or instructor approval.

ART 394 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Fibers Design for Nonmajors
Fee.

ART 476 Fibers: Multiple Harness Weaving. (3)*fall and spring*

Advanced loom techniques and computer pattern design. Emphasis on individual design and loom application. Fee. Prerequisite: ART 113 or 115 or 376 or instructor approval.

ART 477 Printed Textiles. (3)*once a year*

Techniques for screen printing on fabric exploring pattern as a compositional element. Various stencil methods including photographic processes. May be repeated for credit. Studio. Fee. Prerequisite: ART 377 or instructor approval.

ART 478 Advanced Surface Design. (3)*spring in odd years*

Emphasis on personal expression with advanced problems in stitch resist, arashi shibori, transfers, indigo, vat and disperse dyes, and pigments. Studio. Prerequisites: both ART 377 and 477 or only instructor approval.

ART 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Fibers and Surface
Fee.
- (b) Print Textiles
Fee.

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Fibers and Surface
Fee.
- (b) Print Textiles
Fee.
- (c) Printed Textiles
Fee.

INTERMEDIA**ART 345 Visualization and Prototyping I. (3)***spring in even years*

Studio/seminar introduces concepts of computer visualization, modeling, and rapid prototyping in an interdisciplinary manner. Lecture, studio. Prerequisite: General Studies CS course or instructor approval.

ART 346 3D Computer Imaging and Animation. (3)*fall and spring*

3D modeling and animation. Emphasis on concepts and fine arts applications. Studio. Fee. Prerequisites: ART 113, 115; junior standing; instructor approval.

*General Studies: CS***ART 348 Computer Animation I. (3)***fall and spring*

Principles and applications of 3D animation for fine arts. Emphasis on animation techniques for expressive effects. Studio. Fee. Prerequisites: ART 346; junior standing; instructor approval.

ART 439 Mixed Media. (3)*fall and spring*

Exploring visual effects by combining traditional and nontraditional methods, techniques, and concepts. 6 hours a week. May be repeated for credit. Studio. Prerequisites: a combination of ART 113 and 115 and 6 hours additional studio requirements or only instructor approval.

ART 440 New Media Concepts. (3)*fall and spring*

Continued experiments with new media and interdisciplinary concerns in art. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 443. Corequisite: ART 441.

ART 441 Video Art. (1)*fall and spring*

Utilizing video and audio equipment essential to the production of broadcast quality video art. 2 hours a week. May be repeated for credit. Fee. Corequisite: ART 440.

ART 442 Folk/Outsider Art. (3)*fall*

Exploration of ideas, attitudes, and art of contemporary "self-taught," "visionary," and "outsider" artists. Research and studio practice. Lecture, studio. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 443 Intermedia. (3)*fall and spring*

Experimental, conceptual, and interdisciplinary studio art with emphasis on new media and technologies. 6 hours a week. May be repeated once for credit. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 449 Computer Animation and Video. (3)*fall and spring*

Integration of 3D fine arts animation with video and compositing. May be repeated for credit. Studio. Fee. Prerequisite: ART 348 or instructor approval.

ART 450 Computer Animation and Audio. (3)*fall and spring*

Integration of audio with 3D animation for fine arts applications. Includes compositing and effects. May be repeated for credit. Studio. Fee. Prerequisites: ART 449; instructor approval.

ART 470 Computer Animation Portfolio. (3)*fall and spring*

Production of videotape and CD 3D animation portfolios for fine arts and industry integrating animation, video, and audio. May be repeated for credit. Studio. Prerequisites: ART 449; instructor approval.

*General Studies: CS***ART 484 Internship. (1–12)***not regularly offered***ART 494 Special Topics. (1–4)***fall and spring*

Possible topics:

- (a) Digital. (3)
- (b) Intermedia. (3)
- (c) Intermedia Elective. (3)
- (d) Nonelectronic Intermedia. (3)

ART 499 Individualized Instruction. (1–3)*not regularly offered***ART 530 Two-Dimensional and Three-Dimensional Computer Art. (3)***once a year*

Integration of 2D and 3D computer imaging for art. Emphasis on new directions for computer imaging which accounts for media characteristics. Studio.

ART 540 Advanced Computer Art. (3)*once a year*

Study of motion for 3D models, light sources, and surface effects. Assumes students have a comprehension of complex modeling, mapping, and lighting. Studio. Prerequisite: ART 346 or instructor approval.

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Dimensional Animation
Fee.

METALS**ART 272 Jewelry I. (3)***fall and spring*

Emphasis on fabrication in jewelry making. Basic techniques of cutting and piercing, forging and soldering, and forming. 6 hours a week. Fee. Prerequisite: freshman or sophomore or junior standing.

ART 372 Jewelry II. (3)*fall and spring*

Fabricated approach to jewelry making. Techniques in stone setting and surface embellishment. 6 hours a week. Fee. Prerequisites: a combination of ART 113 and 115 and 272 or only instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ART 373 Metalworking I. (3)*once a year*

Compression, die, and stretch forming as applied to hollow form construction. Hot and cold forging techniques as applied to smithing. 6 hours a week. Fee. Prerequisites: a combination of ART 113 and 115 and 272 or only instructor approval.

ART 472 Advanced Jewelry. (3)*fall and spring*

Jewelry making with emphasis on developing personal statements and craftsmanship. 6 hours a week. May be repeated for credit. Fee. Prerequisites: ART 372; instructor approval.

ART 473 Advanced Metalworking. (3)*once a year*

Forging and forming techniques in individualized directions. 6 hours a week. May be repeated for credit. Fee. Prerequisites: ART 373; instructor approval.

ART 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Metals. (3)

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Jewelry Metalworking Fee.

PAINTING**ART 223 Painting I. (3)***fall, spring, summer*

Fundamental concepts and materials of traditional and experimental painting media. Emphasis on preparation of painting supports, composition, and color. 6 hours a week. Prerequisites: ART 113, 115.

ART 227 Watercolor I. (3)*fall and spring*

Fundamental concepts, materials, and techniques of watercolor. Emphasis on problem solving, basic skills, composition, and color. 6 hours a week. Fee. Prerequisites: ART 113, 115.

ART 323 Painting II. (3)*fall and spring*

Development of competency in skills and expression. Assigned problems involve light, space, color, form, and content. 6 hours a week. Prerequisite: ART 223 or instructor approval.

ART 324 Painting III. (3)*fall and spring*

Continuation of ART 323. 6 hours a week. Prerequisite: ART 323 or instructor approval.

ART 325 Figure Painting. (3)*fall and spring*

The human figure clothed and nude as the subject for painting in selected media. 6 hours a week. Fee. Prerequisites: ART 314, 323.

ART 327 Watercolor II. (3)*once a year*

Explorations of personal expression in watercolor. Continued development of watercolor skills using traditional and experimental materials and techniques. 6 hours a week. Fee. Prerequisite: ART 227.

ART 423 Advanced Painting. (3)*fall and spring*

Continuation of ART 324. 6 hours a week. May be repeated for credit. Prerequisite: ART 324.

ART 425 Advanced Figure Painting. (3)*fall and spring*

Continuation of ART 325. 6 hours a week. May be repeated for credit. Fee. Prerequisites: ART 315, 324, 325.

ART 427 Advanced Watermedia. (3)*fall and spring*

Continuation of ART 327. Advanced techniques, concepts, and methods with watercolor and other water-based media on paper. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 327 or instructor approval.

ART 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Painting. (3)

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Figure Painting Fee.
- (b) Watercolor Fee.

PHOTOGRAPHY**ART 201 Photography I. (3)***fall and spring*

Development of skills and techniques of black and white photography. Emphasis on camera work and darkroom procedures. 2 hours lecture, 3 hours lab. Fee.

ART 301 Photography II. (3)*fall and spring*

Photography as an art medium with additional exploration into personal photographic aesthetics. 6 hours a week. Fee. Prerequisites: a combination of ART 113 and 115 and 201 or only instructor approval.

ART 304 Advanced Photography. (3)*fall and spring*

Interpretation and manipulation of light as a tool in the performance of expressive photography. 6 hours a week. Fee. Prerequisite: ART 301 or instructor approval.

ART 305 Color Photography I. (3)*fall and spring*

Application of color transparencies and prints to photographic art. 6 hours a week. Fee. Prerequisite: ART 304 or instructor approval.

ART 308 Digital Photographic Images. (3)*fall and spring*

Scanning, manipulation, refinement, and compositing of photographic images in the computer. Lab, studio. Prerequisites: ART 113, 115, 201; junior standing; instructor approval.

ART 401 Nonsilver Photography. (3)*fall and spring*

Recognition of the inherent characteristics of nonsilver processes and their use in communicating ideas. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 304 or instructor approval.

ART 403 Senior Photographic Projects. (3)*fall and spring*

Technical and philosophical refinement of personal aesthetic with various photographic media. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 304 or instructor approval.

ART 404 Portraiture Photography. (3)*fall and spring*

Photographing people. Critical discussions and slide lectures on issues in portraiture. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 304 or instructor approval.

ART 405 Advanced Color Photography. (3)*fall and spring*

Intensive use of subtractive color process in photographic printing. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 305 or instructor approval.

ART 406 Photo Techniques. (3)*fall and spring*

Camera and darkroom techniques with emphasis on creative control of the black and white print. 6 hours a week. Prerequisite: ART 301 or instructor approval.

ART 407 View Camera. (3)*fall and spring*

View camera and darkroom techniques. Studio, lab. Fee. Prerequisite: ART 301 or instructor approval.

ART 409 Photographic Exhibition. (3)*once a year*

Care of photographic prints, print presentation, and exhibition. Practical experience in gallery operations. 6 hours a week. May be repeated for credit. Prerequisite: ART 304 or instructor approval.

ART 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) 19th-Century Photo Processes. (3)
- (b) Photo. (3)

ART 498 Pro-Seminar. (1–7)*not regularly offered*

Possible topics:

- (a) Landscape Photography: Theory
Fee.

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Advanced Color Photography
Fee.
- (b) Nonsilver Photography
Fee.
- (c) Portraiture Photography
Fee.
- (d) View Camera
Fee.

PRINTMAKING**ART 253 Introduction to Printmaking. (3)***once a year*

Introduction to basic monotype, intaglio, relief, and related techniques. Studio. Fee. Prerequisite: ART 113.

ART 351 Intaglio I. (3)*fall and spring*

Introduction to contemporary and traditional developmental techniques for black and white prints. 6 hours a week. Fee. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 352 Lithography I. (3)*fall and spring*

Monochromatic and color planographic printmaking utilizing stone and aluminum plate processes. 6 hours a week. Fee. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 354 Screen Printing I. (3)*fall and spring*

Introduction to paper, direct, and photographic stencil techniques. 6 hours a week. Fee. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 355 Photo Process for Printmaking I. (3)*fall*

Introduction to photographic principles and skills for photomechanical printmaking processes, including photosilkscreen, photolitho, and photoetching. 6 hours a week. Fee. Prerequisite: ART 201 (or its equivalent).

ART 394 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Relief Printmaking
Fee.

ART 451 Advanced Intaglio. (3)*fall and spring*

Various contemporary and traditional methods of printing to achieve color prints. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 351 or instructor approval.

ART 452 Advanced Lithography. (3)*fall and spring*

Continuation of ART 352. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 352 or instructor approval.

ART 454 Advanced Screen Printing. (3)*once a year*

Continuation of ART 354. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 354 or instructor approval.

ART 455 Advanced Photo Processes for Printmaking. (3)*once a year*

Continued study of photomechanical techniques and applications to printmaking or photographic processes. Fee. Prerequisite: ART 355 or instructor approval.

ART 456 Fine Printing and Bookmaking I. (3)*once a year*

Letterpress printing and typography as fine art. Study of history, alphabets, mechanics of hand typesetting, presswork, and various forms of printed matter. Fee. Prerequisite: instructor approval.

ART 457 Fine Printing and Bookmaking II. (3)*once a year*

Continuation of ART 456. Bookbinding, book design and printing, advanced typography, theory, and presswork. May be repeated for credit. Fee. Prerequisites: ART 456; instructor approval.

ART 458 Papermaking. (3)*fall and spring*

History, theory, demonstrations, sheet forming, collage treatments, and 3-dimensional approaches. 6 hours a week. May be repeated for credit. Fee. Prerequisite: instructor approval.

ART 459 Monoprinting. (3)*fall and spring*

Nonmultiple printed image using a variety of technical approaches. 6 hours a week. May be repeated for credit. Fee. Prerequisites: ART 311, 323 (or any 300-level printmaking class); instructor approval.

ART 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Experimental Paper
Fee.
- (b) Experimental Printmaking
Fee.
- (c) Relief Printmaking
Fee.

ART 551 Intaglio Projects. (3)*fall and spring*

Materials and methods of intaglio as a matrix for exploring various contemporary issues. Specifically structured to accommodate the graduate-level drawing student with no printmaking background. Studio. Fee.

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Advanced Photo Process for Printmaking
Fee.
- (b) Experimental Paper
Fee.
- (c) Fine Printing and Bookmaking I
Fee.
- (d) Fine Printing and Bookmaking II
Fee.
- (e) Lithography
Fee.
- (f) Monoprinting
Fee.
- (g) Papermaking
Fee.
- (h) Photo Processes for Printmaking I
Fee.
- (i) Relief Printmaking
Fee.
- (j) Screen Printing
Fee.

SCULPTURE**ART 231 Sculpture I. (3)***fall, spring, summer*

Exploration of sculptural forms through concepts related to basic materials. Focus on studio production, safety, aesthetic criticism, and history of sculpture. 6 hours a week. Fee. Prerequisites: both ART 113 and 115 or only instructor approval.

ART 274 Wood I. (3)*fall and spring*

Fundamental woodworking techniques to produce creative functional 3D objects. 6 hours a week. Fee.

ART 331 Sculpture II. (3)*fall and spring*

Continuation of ART 231 with an emphasis on metal fabrication as an expressive sculptural process. Techniques in welding, cutting and bending of metals and their aesthetics. 6 hours a week. Fee. Prerequisite: ART 231 or instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ART 332 Sculpture III. (3)*fall and spring*

Explorations in diverse media with a focus on mold making processes. Development of the sculpture portfolio. 6 hours a week. Fee. Prerequisite: ART 331 or instructor approval.

ART 333 Foundry Casting Methods. (3)*fall and spring*

Fine art and techniques of metal casting: mold making, foundry safety, finishing techniques, application of patinas, and history of casting. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 332 or instructor approval.

ART 374 Wood II. (3)*fall and spring*

Individual and directed problems in wood related to the production of unique functional art objects. 6 hours a week. Fee. Prerequisites: a combination of ART 113 and 115 and 274 or only instructor approval.

ART 394 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Carving
Fee.

ART 431 Special Problems in Sculpture. (3)*fall and spring*

Development of a personal approach to sculpture. Emphasis on form, individual problems, and related color technology. Professional practices and presentation. 6 hours a week. May be repeated for credit. Fee. Prerequisites: ART 332; instructor approval.

ART 432 Neon Sculpture. (3)*fall*

Techniques for creating neon in an art context. Glass tube bending and fabrication. Construction of artworks utilizing light-generating gases. 6 hours a week. May be repeated for credit. Fee. Prerequisite: instructor approval.

ART 433 Foundry Research Methods. (3)*fall and spring*

Research in foundry techniques. Studio. Pre- or corequisite: ART 333 or instructor approval.

ART 436 Architectural Sculpture. (3)*not regularly offered*

Sculptural concepts as related to architecture and other man-made environments. Scale drawing, models, and relief sculpture. 6 hours a week. May be repeated for credit. Fee. Prerequisite: ART 332 or instructor approval.

ART 437 Film Animation. (3)*fall*

Production of short 16mm films that feature articulated sculptural objects, models, dolls, puppets, and graphics through the use of single-frame filming techniques. 6 hours a week. May be repeated for credit. Fee. Prerequisite: instructor approval.

ART 438 Experimental Systems in Sculpture. (3)*spring*

Simple electrical and mechanical systems that can be utilized in the context of studio art and installations. Active production of studio artworks required. 6 hours a week. May be repeated for credit. Fee. Prerequisite: instructor approval.

ART 474 Advanced Wood. (3)*fall and spring*

Extended experience and advanced techniques in the use of wood to create functional works of art. 6 hours a week. May be repeated for credit. Fee. Prerequisites: ART 374; instructor approval.

ART 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Advanced Sculpture
Fee.
- (b) Carving
Fee.
- (c) Film: Post-Production
Fee.
- (d) Foundry Casting Methods
Fee.

ART 594 Conference and Workshop. (1–12)*not regularly offered*

Possible topics:

- (a) Carving
Fee.

ART 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Advanced Sculpture
Fee.
- (b) Architectural Sculpture
Fee.
- (c) Experimental Systems in Sculpture
Fee.
- (d) Film: Post-Production
Fee.
- (e) Foundry Casting Methods
Fee.
- (f) Neon Sculpture
Fee.
- (g) Special Problems in Sculpture
Fee.
- (h) Wood
Fee.

SPECIAL STUDIO ART**ART 582 Art Research. (1–12)***fall, spring, summer*

Independent study research using classroom facilities and supplies. Studio.

ART 621 Studio Problems. (3)*fall, spring, summer*

Advanced study. 6 hours a week each section. May be repeated for credit. Possible topics:

Possible topics:

- (a) Ceramics
Fee.
- (b) Drawing
- (c) Fiber Art
- (d) Jewelry Metalworking
Fee.
- (e) Metals
- (f) Painting
- (g) Photography
- (h) Printmaking
Fee.
- (i) Sculpture
- (j) Studio Art
- (k) Wood

Prerequisite: instructor approval.

ART 680 Practicum: M.F.A. Exhibition. (1–15)*fall, spring, summer*

Studio work in preparation for required M.F.A. exhibition. Public exhibit to be approved by the student's supervisory committee and accompanied by a final oral examination. Photographic documentation and written statement of problem. Prerequisite: approval of the student's supervisory committee.

ART 682 M.F.A. Exhibition Research. (1–12)*fall, spring, summer*

M.F.A. exhibition practicum using classroom facilities and supplies. Can be used in place of ART 680. Prerequisite: approval of the student's supervisory committee.

Department of Dance

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PROFESSORS

KAPLAN, KEUTER, LUDWIG, MURPHEY

ASSOCIATE PROFESSORS

MATT, MOONEY

ASSISTANT PROFESSORS

JACKSON, LINDHOLM LANE, PARRISH,
 ROLNICK, VISSICARO

ASSOCIATE RESEARCH PROFESSIONAL

MITCHELL

SENIOR LECTURERS

FITZGERALD, TSUKAYAMA

LECTURER

TONGRET

For advising purposes, all students registering in a Dance degree program enroll through the Herberger College of Fine Arts. Each degree program and area of specialization has its own check sheet that describes the particulars of course sequence and special requirements. These check sheets are available in the Department of Dance office.

Placement Examinations. All students who enroll in dance major technique courses are required to take part in a placement audition to determine their levels of technical proficiency in modern dance and ballet. Official dates for auditions are set for the orientation periods that precede the fall and spring semesters of each academic year. Transfer students who have completed music theory for dance, dance production, or choreography courses at another institution are also required to take placement examinations in these areas before enrolling in intermediate or advanced levels of course work.

DANCE—B.F.A.

The faculty in the Department of Dance offer a Bachelor of Fine Arts degree at the undergraduate level with emphases in four areas of concentration: choreography, dance education, dance studies, and performance. All new Dance majors are admitted into the preprofessional program. Students audition or petition for admission into one of the Bachelor of Fine Arts dance concentrations during the sophomore year of study. Transfers may request admission into the B.F.A. degree after one semester in residence. Further details may be obtained from the Department of Dance.

Graduation Requirements. In addition to fulfilling the major requirements, students must meet all university graduation requirements and college degree requirements. At

least 45 semester hours must be upper-division courses. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 267.

Preprofessional Program. First-semester students in the preprofessional program should take the following courses:

DAN 134 Technique and Theory of Modern Dance	3
DAN 135 Technique and Theory of Ballet	2
ENG 101 First-Year Composition	3
Dance elective	2
General Studies courses	6
Total	16

Core Curriculum. The Dance major consists of a minimum of 59 semester hours in the dance core. All courses in the major must be completed with a grade of “C” or higher. The following areas make up the core curriculum.

Technique. Twenty-six semester hours in ballet and modern technique are required.

Performance. Two upper-division courses are required.

Theory. The following dance theory courses are required:

DAH 100 Dance in World Cultures <i>HU</i>	3
DAN 221 Rhythmic Theory for Dance I	2
DAN 222 Rhythmic Theory for Dance II	2
DAN 340 Dance Kinesiology	4
Total	11

Choreography and Improvisation. The following courses are required:

DAN 264 Improvisational Structures	3
DAN 265 Approaches to Choreography	3
Total	6

History. Choose two from the following three courses:

DAH 301 Philosophy and Criticism of Dance <i>L/HU</i>	3
DAH 302 Cross-Cultural Dance Perspectives <i>L/HU, G</i>	3
DAH 401 Dance History <i>I HU</i>	3

Production. Choose one of the following two courses:

DAN 210 Dance Production I	3
DAN 211 Dance Production II	3

Dance Concentration Curriculum. Each concentration in the dance curriculum—choreography, dance education, dance studies, and performance—is composed of 25 semester hours.

Choreography

Core Curriculum. See “Core Curriculum,” on this page.

Specialization. The following courses are required for the choreography specialization:

DAN 228 Dance Notation I	3
DAN 321 Music Literature for Dance	3
DAN 364 Choreography and Accompaniment	3
DAN 365 Advanced Choreography	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

DAN 480 Senior Performance in Dance	4
Total	16

Production. The following two courses are required:

DAN 210 Dance Production I	3
DAN 211 Dance Production II	3

Additional requirements are listed on the check sheet available from the Department of Dance.

Dance Education

Core Curriculum. See “Core Curriculum,” page 285.

Specialization. The following courses are required for the dance education specialization:

DAN 321 Music Literature for Dance	3
DAN 359 Dance Education Theory	3
DAN 364 Choreography and Accompaniment	3
DAN 365 Advanced Choreography	3
DAN 480 Senior Performance in Dance	4
Total	16

Production. The following two courses are required:

DAN 210 Dance Production I	3
DAN 211 Dance Production II	3

Dance Methods. Choose two of the following three courses:

DAN 350 Methods of Teaching Modern Dance in Secondary Education	3
DAN 351 Methods of Teaching Ballet	3
DAN 357 Children’s Dance	3

A student pursuing the B.F.A. degree in Dance Education may also choose to become certified to teach dance (K–12) in Arizona public schools. Students should apply to the College of Education in the middle of the sophomore year. To be considered for admission to the teacher certification program, students must complete an admission portfolio specified by the College of Education, which may include completion of the Pre-Professional Skills Test (PPST). Students should be advised that at least 20 additional semester hours are required to complete certification requirements. For more information, consult the dance education advisor and College of Education Office of Student Affairs.

Additional requirements are listed on the check sheet available from the Department of Dance.

Dance Studies

Core Curriculum. See “Core Curriculum,” page 285.

Specialization. The following courses are required for the dance studies specialization:

DAH 495 Dance Research Sources	2
DAH 496 Senior Thesis Project	2
Total	4

Twenty additional hours approved by an advisor must be taken in no more than two related fields. Additional requirements are listed on the check sheet available from the Department of Dance.

Performance

Core Curriculum. See “Core Curriculum,” page 285.



The Dance Studio Theatre is devoted to informal and formal showcases of student and faculty choreographic work.

Tim Trumble photo

Specialization. The following courses are required for the performance specialization:

DAN 321 Music Literature for Dance	3
DAN 380 Performance Studies Practicum	3
DAN 480 Senior Performance in Dance	4
THP 101 Introduction to the Art of Acting	3
Total	13

Production. The following two courses are required:

DAN 210 Dance Production I	3
DAN 211 Dance Production II	3

Performance. Choose from the following three courses (six semester hours are required):

DAN 371 Dance Theatre Performance/Production	1-3
DAN 471 Dance Arizona Repertory Theatre	3-4
DAN 472 Concert Dance	2

Additional requirements are listed on the check sheet available from the Department of Dance.

MINOR

The department offers a minor in Dance consisting of 18 semester hours of course work, including 12 upper-division hours. A minimum grade of "C" is required in all courses. Dance minor requirements include:

Performance or choreography	3
Technique	6
Theory	6
Electives	3

Interested students should contact the Department of Dance for specific requirements and admission procedures.

GRADUATE PROGRAM

A total of 60 semester hours of graduate credit is required: 30 hours of dance studio; 12 hours of dance theory; nine hours of electives; and nine hours of individual project (choreography, performance, or other approved project). In addition to choreography and performance, specialized areas of emphasis are available within the 60-semester-hour program. In consultation with the graduate director, specific interests, needs, and abilities determine a program of study that directs course work in alternative directions.

DANCE HISTORY (DAH)

DAH 100 Dance in World Cultures. (3)

fall, spring, summer

Orientation to the field of dance focusing on history, styles, cultural, and theatrical aspects of the art form from a global perspective.

General Studies: HU

DAH 190 Introduction to the Dance Profession. (1)

fall

Orientation to the dance profession introducing career options and university/department resources. Designed for Dance majors.

DAH 300 Focus on Dance. (3)

fall, spring, summer

Specialized study of cultural and theatrical aspects of dance, such as social dance forms, specific genres or historical periods. May be repeated for credit. Lecture, studio. No credit for students who have completed DAH 100.

General Studies: HU

DAH 301 Philosophy and Criticism of Dance. (3)

fall and spring

Philosophical issues in dance and dance criticism, with emphasis on written analysis and interpretation. Prerequisite: 1 semester of First-Year Composition.

General Studies: L/HU

DAH 302 Cross-Cultural Dance Studies. (3)

fall and spring

Comparative analysis of dance in diverse cultural contexts. Ethnographic research project required. Prerequisites: completion of First-Year Composition requirement; junior standing.

General Studies: L/HU, G

DAH 401 Dance History. (3)

fall

Survey of the history of dance with emphasis on trends in Western dance from the 15th century to contemporary times.

General Studies: HU

DAH 495 Dance Research Sources. (2)

fall

Investigation of various resources and methods for conducting research in dance. Seminar. Prerequisite: instructor approval.

DAH 496 Senior Thesis Project. (2)

spring

Culminating research project that integrates dance and a related field of interest. Prerequisite: DAH 495.

DAH 501 Philosophy of Dance. (3)

once a year

Analysis of traditional and contemporary theories of dance with regard to issues of expression, form, and meaning.

DAH 502 Cultural Concepts of Dance. (3)

once a year

Examines the close connection between culture, dance, and movement through writings in cultural theory, dance ethnology, and philosophy.

DANCE (DAN)

DAN 130 Dance. (2)

fall, spring, summer

Introduction to styles and forms of dance; ballet, modern, jazz, tap, ballroom, ethnic. May be repeated for credit.

DAN 134 Technique and Theory of Modern Dance. (3)

fall and spring

Elementary concepts of modern dance technique. Development of movement quality and performance skills. 6 hours weekly. May be repeated for credit. Placement audition required. Prerequisite: Dance major.

DAN 135 Technique and Theory of Ballet. (2)

fall and spring

Elementary ballet technique with emphasis on alignment, control, and development of the feet with proper awareness of style and phrasing. 4 hours weekly. May be repeated for credit. Placement audition required.

DAN 164 Improvisation. (1)

fall and spring

Improvisation techniques employing the basic elements of space, time, and energy. Studio.

DAN 210 Dance Production I. (3)

fall

Theory and practice of lighting, scenery, sound, and stage management for dance production. Labs cover all areas of production. Lecture, lab.

DAN 211 Dance Production II. (3)

spring

Theory and practice of arts management and costume design for dance production. Labs cover all areas of production. Lecture, lab.

DAN 221 Rhythmic Theory for Dance I. (2)

fall

Elements of music, music structures, and their relationship to dance. Emphasis on rhythmic analysis and dance accompaniment.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

DAN 222 Rhythmic Theory for Dance II. (2)*spring*

Continuation of DAN 221 with an emphasis on small group/movement projects in relation to musical time and structure. CD-ROM work included. Prerequisite: DAN 221 or proficiency exam.

DAN 228 Dance Notation I. (3)*fall and spring*

Survey of systems of dance notation. Introduction to effort-shape analysis of movement. Emphasis on learning elementary labanotation. Lecture, studio. Prerequisites: DAN 221; MUS 100.

DAN 230 Dance. (2)*fall, spring, summer*

Intermediate levels. Continuation of DAN 130. May be repeated for credit.

DAN 234 Technique and Theory of Modern Dance. (3)*fall and spring*

Intermediate concepts of modern dance technique. Development of movement quality and performance skills. 6 hours weekly. May be repeated for credit. Placement audition required.

DAN 235 Technique and Theory of Ballet. (2)*fall and spring*

Advanced study of elementary ballet technique through the traditional exercises, with proper awareness of style and phrasing. 4 hours weekly. May be repeated for credit. Placement audition required.

DAN 237 Beginning Pointe. (1)*fall and spring*

Study of elementary pointe technique through the traditional exercises. 2 hours weekly. May be repeated for credit. Prerequisites: basic ballet training; instructor approval.

DAN 264 Improvisational Structures. (3)*fall*

Introduction to basic improvisational and choreographic principles with emphasis on current media and technology, group structures, and movement invention. Lecture, studio.

DAN 265 Approaches to Choreography. (3)*spring*

Intermediate application of basic choreographic principles with emphasis on improvisation, form, content, and evaluative skills. Lecture, studio. Prerequisite: DAN 264.

DAN 311 Methods of Teaching Children's Dance. (3)*fall and spring*

Theory and practice of teaching creative dance to children. Designed for Dance majors and related curricula, but open to all students.

DAN 321 Music Literature for Dance. (3)*fall and spring*

Historical survey of music and compositional elements relative to dance. Emphasis on analysis of choreography from a musical standpoint. CD-ROM lab. Lecture, lab. Prerequisites: both DAN 221 and 222 or only instructor approval. Pre- or corequisite: MUS 340.

DAN 328 Dance Notation II. (2)*spring*

Intermediate study of labanotation. Emphasis on score reading. Prerequisite: DAN 228 (or its equivalent).

DAN 330 Dance. (2)*fall, spring, summer*

Advanced levels. Continuation of DAN 230. May be repeated for credit.

DAN 334 Technique and Theory of Modern Dance. (3)*fall and spring*

Advanced concepts of modern dance technique. Development of movement quality and performance skills. 6 hours weekly. May be repeated for credit. Placement audition required.

DAN 335 Technique and Theory of Ballet. (2)*fall and spring*

Intermediate ballet technique with emphasis on strength, dynamics, rhythmical impulses, and transitions with awareness of proper style and phrasing. 4 hours weekly. May be repeated for credit. Placement audition required.

DAN 337 Intermediate Pointe. (1)*fall and spring*

Study of intermediate and advanced pointe technique through the traditional exercises. 2 hours weekly. May be repeated for credit. Prerequisite: DAN 237 or instructor approval.

DAN 340 Dance Kinesiology. (4)*spring*

Kinesiological principles applied to dance technique, including analysis of muscular patterns in dance movement and the pathomechanics of dance injury. Prerequisite: BIO 201 or instructor approval.

DAN 342 Ideokinesis. (2)*fall*

Study of posture using the visualization of image/goals to facilitate improved alignment and movement efficiency. May be repeated for credit. Lecture, studio.

DAN 350 Methods of Teaching Modern Dance in Secondary Education. (3)*fall*

Analysis and acquisition of teaching materials for the technique, improvisation, and choreography of modern dance. Lecture, studio. Pre- or corequisite: DAN 359.

DAN 351 Methods of Teaching Ballet. (3)*spring*

Analysis and acquisition of teaching techniques and materials for ballet, jazz, and multicultural dance forms. Lecture, studio. Pre- or corequisite: DAN 359.

DAN 359 Dance Education Theory. (3)*fall*

Application of principles of motivation, learning, and evaluation to the teaching of dance.

DAN 364 Choreography and Accompaniment. (3)*fall*

Experience in the use of traditional and nontraditional musical structures as a basis for choreographic projects. Lecture, studio. Prerequisite: DAN 321.

DAN 365 Advanced Choreography. (3)*spring*

Investigation and practice of contemporary styles of choreography. Studio. Prerequisites: DAN 264 and 265 (or their equivalents).

DAN 371 Dance Theatre Performance/Production. (1–3)*fall and spring*

Performance or technical theatre work in designated dance productions. 3 hours a week per semester hour. May be repeated for credit. Prerequisite: instructor approval.

DAN 380 Performance Studies Practicum. (3)*spring*

Focus on developing rehearsal skills and achieving performance excellence through the preparation of three completed works. Studio, lab.

DAN 423 Dance, Computers, and Multimedia. (3)*fall and spring*

Introduction to desktop multimedia as it relates to dance creation, education, production, and research. Lecture, lab.

*General Studies: CS***DAN 434 Technique and Theory of Modern Dance. (3)***fall and spring*

Preparation in the performance and comprehension of professional-level modern dance technique. 6 hours weekly. May be repeated for credit. Placement audition required.

DAN 435 Technique and Theory of Ballet. (2)*fall and spring*

Study of professional advanced ballet technique with emphasis on preparation for performance. 4 hours weekly. May be repeated for credit. Placement audition required.

DAN 471 Dance Arizona Repertory Theatre. (3–4)*fall and spring*

Preprofessional modern dance company, emphasizing outreach and performance. Opportunity to work with guest artists and community schools and organizations. Lecture, studio. Prerequisite: instructor approval.

DAN 472 Concert Dance. (2)*fall and spring*

Extensive preparation of repertory or new works created by experienced choreographers. Simulates dance company experience, culminating in performance. Studio. Prerequisites: audition; instructor approval.

DAN 480 Senior Performance in Dance. (2)*fall*

Original choreography for group performance with analysis and critique of problems encountered in production. Must be repeated for a total of 4 credits. Prerequisites: DAN 364, 365.

DAN 484 Dance Internship. (1–3)*fall and spring***DAN 494 Special Topics. (1–4)***once a year*

Possible topics:

- (a) Concert Dance. (2)

DAN 510 Dance Stagecraft and Production. (1–3)*fall and spring*

Theory of costuming, lighting, makeup, scenery, and sound as related to dance performance. May be repeated once for credit. Lecture, studio. Prerequisite: DAN 211 (or its equivalent).

DAN 521 Sound Lab I. (2)*fall*

Audio mixing for analog/digital recording and editing. Lecture, lab. Prerequisite: instructor approval.

DAN 522 Sound Lab II. (2)*spring*

Continuation of DAN 521. Focus on digital recording/editing of audio compositions for choreographic projects. Lecture, lab. Pre- or corequisite: DAN 423 or 521.

DAN 523 Dance, Computers, and Multimedia. (3)*fall and spring*

Introduction to desktop multimedia as it relates to dance creation, production, education, and research. Lecture, lab.

DAN 534 Technique and Theory of Modern Dance. (3)*fall and spring*

Preparation in the performance and comprehension of professional-level modern dance for first-year graduate students. 6 hours weekly. May be repeated for credit. Placement audition required.

DAN 535 Technique and Theory of Ballet. (2)*fall and spring*

Graduate study of ballet technique. May be repeated for credit. Studio. Placement audition required.

DAN 542 Ideokinesis. (2)*fall*

Theoretical examination of ideokinetic methods of facilitating postural change and movement efficiency.

DAN 550 Graduate Dance Pedagogy: Modern. (3)*spring*

Overview of the role of modern dance technique and theory in the university curriculum including current pedagogical theory, diversity, gender. May follow or precede internship in practical teaching.

DAN 551 Graduate Dance Pedagogy: Ballet. (3)*fall*

Advanced analysis of teaching techniques for ballet. Prerequisite: instructor approval.

DAN 561 Choreographer/Composer Workshop. (1–3)*not regularly offered*

Analysis of, experimentation with, and practice in working with composers of music for choreography. Open to experienced choreographers and composers. Lecture, studio. Prerequisite: instructor approval.

DAN 564 Solo and Group Choreography I. (3)*fall*

Original choreography created for solo and group performance. Studio. Prerequisites: DAN 364 and 365 (or their equivalents).

DAN 565 Solo and Group Choreography II. (3)*spring*

Continuation of DAN 564. Studio. Prerequisite: DAN 564.

DAN 571 Dance Theatre. (1–3)*fall and spring*

Performance in specially choreographed dance productions. May be repeated for credit. Prerequisite: instructor approval.

DAN 580 Performance Studies Practicum. (1–3)*spring*

Focus on developing rehearsal skills and achieving performance excellence through the preparation of three completed works. Studio, lab.

DAN 591 Seminar. (1–3)*fall and spring*

Seminar focusing on enrichment topics, production aspects of thesis projects, teaching concerns, special lectures, films, or critiques.

DAN 634 Technique and Theory of Modern Dance. (3)*fall and spring*

Preparation in the performance and comprehension of professional-level modern dance for second-year graduate students. 6 hours weekly. May be repeated for credit. Placement audition required.

DAN 640 Advanced Problems in Analysis of Dance Technique. (3)*spring*

Theories and principles of human anatomy, kinesiology, and the psychology of learning applied to analysis of dance movement. Prerequisites: both DAN 340 and 342 or only instructor approval.

DAN 664 Choreography Workshop. (1–3)*fall*

Choreographic study in a seminar context with faculty and guest artists. May be repeated for credit. Studio. Prerequisites: DAN 564, 565.

DAN 671 Dance Arizona Repertory Theatre. (3–4)*fall and spring*

Preprofessional modern dance company, emphasizing outreach and performance. Opportunity to work with guest artists and community schools and organizations. Lecture, studio. Prerequisite: instructor approval.

DAN 693 M.F.A. Project. (1–9)*fall, spring, summer*

Preparation for required M.F.A. project approved by the student's supervisory committee. Work is followed by a final oral examination and documentation appropriate to the project. Prerequisite: committee approval.

School of Music

Wayne A. Bailey
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REGENTS' PROFESSORS

HICKMAN, PAGANO

PROFESSORS

BAILEY, BRITTON, COSAND, CROWE, DeMARS, DOAN, DREYFOOS, FLEMING, HACKBARTH, HAMILTON, HILL, HOFFER, HUMPHREYS, KLIEWER-BRITTON, KOONCE, LOCKWOOD, MAROHNIC, METZ, OLDANI, PILAFIAN, REBER, ROGERS, RUSSELL, SELLHEIM, SHINN, SKOLDBERG, SPRING, STAUFFER, STOCKER, SUNKETT, SWAIM, THOMPSON, UMBERSON, WILLIAMSON, WYTKO

ASSOCIATE PROFESSORS

CARPENTER, HAEFER, HOLBROOK, KOPTA, LYMAN, MARSHALL, MAY, PETERSON, RAVE, ROCKMAKER, SMITH, SOLIS, WILSON

ASSISTANT PROFESSORS

BRYAN, BUSH, McLIN, MEIR, RIO, SCHURING, SULLIVAN

SENIOR LECTURERS

NORTON, SHELLANS

LECTURER

TONGRET

ACADEMIC PROFESSIONAL

CAMPBELL

The School of Music is a member of the National Association of Schools of Music, and the requirements for entrance and graduation set forth in this catalog are in accordance with the published regulations of the association. The following statement of basic musicianship is endorsed by the School of Music:

All musicians, whether performers, composers, scholars, or teachers, share common professional needs. Every musician must to some extent be a performer, a listener, a historian, a composer, a theorist, and a teacher. For this reason, certain subject matter areas and learning processes are common to all baccalaureate degrees in music.

Basic musicianship is developed in studies that prepare the student to function in a variety of musical roles that are supportive of his/her major concentration. All undergraduate curricula, therefore, provide the following:

1. A conceptual understanding of such musical properties as *sound, rhythm, melody, harmony, texture, and form* and opportunities for developing a comprehensive grasp of their interrelationships as they form the cognitive-affective basis for listening, composing and performing.
2. Repeated opportunities for enacting in a variety of ways the roles of listener (analysis), performer (interpretation), composer (creation), scholar (research), and teacher.
3. A repertory for study that embraces all cultures and historical periods.

All students registering in a School of Music major program enroll through the Herberger College of Fine Arts.

Audition/Admission Requirements. All students interested in majoring in Music at ASU enter the university in the preprofessional program in Music. Students progress to one of the Music major options upon successful completion of a music audition heard by music faculty. The preprofessional program is designed to prepare students who have performance deficiencies and/or music academic deficiencies for entry into the major degree program.

Students who wish to be Music majors who do not successfully complete the audition are allowed to remain in the preprofessional program for two semesters (excluding summer and winter sessions). They are allowed to reaudition two times in addition to the initial audition; these additional auditions may take place either during or at the end of each fall or spring semester that the student is enrolled under this program. During these semesters, the student is allowed to enroll in music ensembles; concert attendance; and general studies courses to be chosen through consultation with a School of Music academic advisor. Students are also assisted in obtaining private instruction on their major instrument through either the School of Music preparatory program or with private instructors. These private instructions are not required and do not generate university course credit hours. The reauditions are heard and evaluated by School of Music faculty.

All students who enroll in an undergraduate music degree program are required to pass an entrance audition in their primary performing medium (instrument or voice) before being admitted to the School of Music. Audition forms and specific audition requirements for each instrument or voice may be obtained upon request by contacting the School of Music. Official dates for these auditions are set for each academic year.

Admission to the composition concentration is subject to the approval of the composition faculty based upon an evaluation of the student's compositions and/or interview.

Diagnostic Examinations. Entering students, including *all* transfer students, must take a diagnostic examination in piano during orientation week of their first semester on campus, regardless of previous piano course work completed. All students are required to reach a minimum level of piano proficiency.

Continuation in the composition program is subject to review in the sophomore or junior year.

All Music Education majors, including transfer and post-baccalaureate students, must perform an additional audition before being admitted to the teacher education program. Normally, this audition occurs during the sophomore year.

All students majoring in Music Therapy must pass MUE 211 Music in Recreation and a music therapy faculty review and screening interview before being passed into upper-division study.

MUSIC—B.A.

The Bachelor of Arts degree requires a minimum of 120 semester hours for graduation.

The Music major consists of 50 semester hours and includes the requirements that follow for each area of study.

In addition to fulfilling the major requirements, students must meet all university graduation requirements and col-

lege degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 267.

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
MTC 422 Musical Acoustics	3
Total	20

Music History. Three semester hours of MHL 341 Music History and three semester hours of MHL 342 Music History are required. Nine elective upper-division hours in music history and/or theory are required.

Major Performing Medium. Eight semester hours of MUP 111 Studio Instruction or MUP 311 Studio Instruction are required. At least four of these hours must be at ASU.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

The remaining semester hours in music are selected by the student in consultation with an advisor. Areas of study may include ethnomusicology, music education, music history, music theory, and performance. At least 23 semester hours, 12 in the field of specialization, must be in the upper division. Students must select sufficient elective courses to complete the 120 hours required for graduation.

BACHELOR OF MUSIC DEGREE

All Bachelor of Music (B.M.) degree programs require 120 semester hours for graduation excluding Music Education (125 semester hours) and Music Therapy (129 semester hours). The B.M. curriculum offers majors in Music Education, Music Therapy, Performance, and Theory and Composition.

The curricula for the Music Education and Music Therapy majors require more than 120 semester hours. A student wishing to complete these programs in four years is required to take more than 15 semester hours per semester or to attend summer sessions.

The music curriculum for the remaining B.M. majors listed consists of 79 semester hours. The requirements for each major are listed on this page. In addition, the Music Education major provides certification to students interested in teaching in the public schools.

In addition to fulfilling the major requirements, students must meet all university graduation requirements and college degree requirements. See “University Graduation Requirements,” page 74, and “College Degree Requirements,” page 267.

MUSIC EDUCATION—B.M.

Choral-General Concentration

This degree program may include a teaching minor in instrumental music.

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 327 Form and Analysis I	3
Total	15

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Conducting. The following conducting courses are required:

MUP 209 Beginning Choral Conducting	1
MUP 339 Choral Conducting	2
Total	3

Music Education. The following music education courses are required:

MUE 110 Introduction to Music Education	1
MUE 313 Elementary Music Methods	3
MUE 315 General Music in the Secondary Schools	2
MUE 480 Choral Methods	3
Total	9

Major Performing Medium. Eight semester hours of MUP 111 Studio Instruction and eight semester hours of MUP 311 Studio Instruction are required to obtain a proficiency level necessary to meet the graduation recital requirement. MUP 495 Solo Performance completes the requirement.

Minor Performing Medium. A proficiency equal to six semesters of study in keyboard or voice (whichever is not the major performing medium) is required. Students wishing to extend their proficiency beyond this level may continue to study in MUP 321 Studio Instruction.

Ensemble. Eight different semesters of participation, including at least six semesters of MUP 352 Concert Choir and/or MUP 353 University Choir, four of which must be at ASU, are required.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Instrumental Concentration

It is strongly recommended that this degree program include courses in choral music or courses in jazz education.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 327 Form and Analysis I	3
Total	15

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Conducting. The following conducting courses are required:

MUP 210 Beginning Instrumental Conducting	1
MUP 340 Instrumental Conducting	2
Total	3

Music Education. The following music education courses are required:

MUE 110 Introduction to Music Education	1
MUE 315 General Music in the Secondary Schools	2
MUE 317 Educational Methods for Violin and Viola	1
MUE 318 Educational Methods for Cello and String Bass	1
MUE 327 Educational Methods for Trumpet and Horn	1
MUE 328 Educational Methods for Trombone, Euphonium, and Tuba	1
MUE 336 Educational Methods for Percussion	1
MUE 337 Educational Methods for Flute, Clarinet, and Saxophone	1
MUE 338 Educational Methods for Double Reed Instruments	1
MUE 481 Instrumental Practicum/Methods	5
MUE 482 Instrumental Practicum/Methods	5
Total	20

Major Performing Medium. Eight semester hours of MUP 111 Studio Instruction and eight semester hours of MUP 311 Studio Instruction are required to obtain a proficiency level necessary to meet the graduation recital requirement. MUP 495 Solo Performance completes the requirement.

Ensemble. Eight different semesters of participation in an ensemble are required, four of which must be at ASU. For wind and percussion players, two of the four ASU semesters must be in marching band. String players must have a minimum of six semesters of MUP 345 Symphony Orchestra. Wind and percussion players must have a minimum of six semesters of MUP 361 Marching and Concert Bands.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

String Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 327 Form and Analysis I	3
Total	15

Music History. Three semester hours of MHL 341 Music History and three semester hours of MHL 342 Music History are required.

Conducting. The following conducting courses are required:

MUP 210 Beginning Instrumental Conducting	1
MUP 340 Instrumental Conducting	2
Total	3

Music Education. The following music education courses are required:

MUE 110 Introduction to Music Education	1
MUE 315 General Music in the Secondary Schools	2
MUE 317 Educational Methods for Violin and Viola	1
or MUE 318 Educational Methods for Cello and String Bass (1)	
MUE 335 Educational Methods for Guitar	1
MUE 336 Educational Methods for Percussion	1
MUE 482 Instrumental Practicum/Methods	5
MUE 485 String Practicum/Methods	2
Total	13

Also required are MUP 121 Studio Instruction for three semester hours in a stringed instrument other than the major instrument, MUP 121 for one semester hour in a third stringed instrument, and MUP 121 for one semester hour in a fourth stringed instrument.

Major Performing Medium. Eight semester hours of MUP 111 Studio Instruction and eight semester hours of MUP 311 Studio Instruction are required to obtain a proficiency level necessary to meet the graduation recital requirement. MUP 495 Solo Performance completes the requirement.

Ensemble. Eight different semesters of participation in an ensemble are required, four of which must be at ASU. Six semesters of MUP 345 Symphony Orchestra or equivalent are required.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Recommended Elective. MUE 313 Elementary Music Methods.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

MUSIC THERAPY—B.M.

Students are eligible to apply for the Certification Exam offered by the Certification Board for Music Therapists upon completion of the requirements for graduation.

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 327 Form and Analysis I	3
MTC 422 Musical Acoustics	3
Total	18

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Conducting. One of the following two courses is required:

MUP 209 Beginning Choral Conducting	1
MUP 210 Beginning Instrumental Conducting	1

Music Education. The following music education courses are required:

MUE 211 Music in Recreation	2
MUE 313 Elementary Music Methods	3
MUE 335 Educational Methods for Guitar	1
MUE 336 Educational Methods for Percussion	1
MUE 389 Repertoire for Music Therapy	3
Total	10

Music Therapy. The following music therapy courses are required:

MUE 161 Introduction to Music Therapy	2
MUE 261 Music Therapy as a Behavioral Science	2
MUE 361 Music Therapy Theory and Practice in Psychopathology	3
MUE 362 Music Therapy Techniques	3
MUE 381 Music Therapy Research <i>L</i>	3
MUE 384 Therapy Preclinical I	1
MUE 385 Therapy Preclinical II	1
MUE 386 Therapy Preclinical III	1
MUE 387 Therapy Preclinical IV	1
MUE 388 Therapy Preclinical V (elective)	1
MUE 441 Psychology of Music	3
MUE 475 Group Process and Music Therapy	1
MUE 476 Internship in Music Therapy	1
Total	23

Major Performing Medium. Six to eight semesters are required in the major performing medium, which must include at least two semester hours of MUP 311 Studio Instruction.

Voice. Two semesters of study in voice are required.

Ensembles. Six semesters of ensemble participation are required with at least four semesters in large groups.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Additional Requirements. These courses are also required:

BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
PGS 101 Introduction to Psychology <i>SB</i>	3
PGS 466 Abnormal Psychology <i>SB</i>	3
PSY 230 Introduction to Statistics <i>CS</i>	3
or STP 226 Elements of Statistics <i>CS</i> (3)	
SOC 101 Introductory Sociology <i>SB</i>	3
Four semesters of dance (DAN only)	4
Total	20

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

PERFORMANCE—B.M.

Guitar Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
Total	17

Music History. Three semester hours of MHL 341 Music History and three semester hours of MHL 342 Music History are required.

Repertoire and Pedagogy. Two semester hours of MUP 451 Repertoire and two semester hours of MUP 481 Performance Pedagogy and Materials are required.

Conducting. MUP 210 Beginning Instrumental Conducting is required.

Major Performing Medium. Sixteen semester hours of MUP 127 Studio Instruction and 16 semester hours of MUP 327 Studio Instruction are required to attain a proficiency level necessary to meet the graduation recital requirements. A half recital (MUP 495 Solo Performance) and a full recital (MUP 496 Solo Performance) are also required.

Ensemble. Eight semester hours of ensemble are required within a minimum of six different semesters. Four of the eight semester hours must be MUP 379 Chamber Music Ensemble: Guitar.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

Additional Requirements. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Jazz Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 315 Modern Arranging	2
MTC 316 Modern Arranging	2
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
MTC 440 Jazz Theory and Ear Training	2
MTC 441 Jazz Composition	2
Total	25

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
MHL 352 The Evolution of Jazz <i>H</i>	3
Total	9

Conducting. MUP 210 Beginning Instrumental Conducting is required.

Major Performing Medium. Eight semester hours of MUP 111 Studio Instruction and eight semester hours of MUP 311 Studio Instruction are required to obtain a proficiency level necessary to meet the graduation recital requirements. Two half recitals (MUP 495 Solo Performance) are required, with one in the jazz idiom.

Improvisation. The following courses are required:

MUP 141 Jazz Fundamentals	1
MUP 142 Jazz Fundamentals	1
MUP 217 Improvisation Workshop	2
MUP 218 Improvisation Workshop	2
MUP 417 Advanced Improvisation	2
MUP 418 Advanced Improvisation	2
Total	10

Workshops. The following courses are required:

MUP 319 Recording Studio Techniques	2
MUP 320 MIDI Workshop	2
Total	4

Ensemble. Eight semesters of ensemble are required, including six semesters of MUP 379 Chamber Music Ensembles and two semesters of MUP 386 Stage Band.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

Keyboard Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3

MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
MTC 425 Studies in 20th-Century Theory	3
or MTC 428 Form and Analysis II (3)	
Total	20

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Repertoire and Pedagogy. The following courses are required:

MUP 451 Repertoire	2
MUP 481 Performance Pedagogy and Materials	2
or MUP 482 Piano Pedagogy II (2)	
Total	4

Conducting. One of the following two courses is required:

MUP 209 Beginning Choral Conducting	1
MUP 210 Beginning Instrumental Conducting	1

Harpichord. One semester hour of harpichord is required.

Major Performing Medium. Sixteen semester hours of MUP 127 Studio Instruction and 16 semester hours of MUP 327 Studio Instruction are required to attain a proficiency level necessary to meet the graduation recital requirements. A half recital (MUP 495 Solo Performance) and a full recital (MUP 496 Solo Performance) are required.

Ensemble. Eight semester hours of ensemble within a minimum of six different semesters are required, including two semesters of accompanying and two semesters of chamber music.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Additional Requirements. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

Music Theatre Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 327 Form and Analysis I	3
Total	15

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Major Performing Medium. Eight semester hours of MUP 111 Studio Instruction and eight semester hours of MUP 311 Studio Instruction are required to attain a proficiency level necessary to meet the graduation requirement of a public performance of two roles, both of which must be of major proportion.

Music Theatre. Five semesters of MUP 370 Music Theatre: Techniques; four semesters of MUP 371 Music Theatre: Workshops; eight semesters of MUP 373 Music Theatre: Performance; two semesters of MUP 374 Music Theatre: Production; and one semester of MUP 451 Repertoire: Broadway Musicals are required.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Additional Requirements. Nine semester hours in theatre and 11 semester hours in dance are required. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

Opera Option. For those students whose goal is opera performance, the following substitutions to the course of study may be made: MUP 451 Repertoire: Opera instead of MUP 451 Repertoire: Broadway Musicals, and two semesters of MUP 371 Music Theatre: Aria Preparation and three semesters of MUP 250 Diction for Singers instead of five semester hours of dance. Permission of the director of the music theatre program is required.

Orchestral Instrument Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
MTC 425 Studies in 20th-Century Theory	3
Total	20

Music History. The following courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Repertoire and Pedagogy. One of the following two courses is required:

MUP 451 Repertoire	2
MUP 481 Performance Pedagogy and Materials	2

Conducting. The following courses are required:

MUP 210 Beginning Instrumental Conducting	1
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MUP 340 Instrumental Conducting	2
Total	3

Major Performing Medium. Sixteen semester hours of MUP 127 Studio Instruction and 16 semester hours of MUP 327 Studio Instruction are required to attain a proficiency level necessary to meet the graduation recital requirements. A half recital (MUP 495 Solo Performance) and a full recital (MUP 496 Solo Performance) are required.

Ensemble. Eight semester hours of large ensembles within a minimum of six different semesters are required plus four semester hours of small ensembles within a minimum of four different semesters.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

Additional Requirements. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

Piano Accompanying Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
MTC 428 Form and Analysis II	3
Total	20

Music History. The following courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Diction and Repertoire. The following courses are required:

MUP 250 Diction for Singers	1
MUP 451 Repertoire	2
MUP 453 Song Literature	2
MUP 454 Song Literature	2
Total	7

Conducting. One of the following two courses is required:

MUP 209 Beginning Choral Conducting	1
MUP 210 Beginning Instrumental Conducting	1

Major Performing Medium. The following courses are required:

MUP 127 Studio Instruction	16
MUP 311 Studio Instruction	8

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MUP 337 Studio Instruction: Piano Accompanying	8
Total	32

In addition, each student accompanies two half recitals (MUP 495 Solo Performance), one for a singer and one for an instrumentalist, during his or her junior year. (A half solo recital may be substituted for either of the above.) During the senior year, the student accompanies two full recitals (MUP 496 Solo Performance), one vocal and one instrumental.

Ensemble. Two semesters of MUP 379 Chamber Music Ensembles, one semester of MUP 379 Chamber Music Ensembles (piano), one semester of MUP 487 Piano Accompanying, four semesters of MUP 388 Piano Accompanying, and two semesters of ensemble elective (minimum of six different semesters) are required.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Language. Eight semester hours of one foreign language (French, Italian, or German) are required.

Additional Requirements. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

Voice Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
or MTC 321 Tonal Counterpoint (2)	
MTC 327 Form and Analysis I	3
MTC 425 Studies in 20th-Century Theory	3
Total	20

Music History. The following music history courses are required:

MHL 341 Music History	3
MHL 342 Music History	3
Total	6

Repertoire and Pedagogy. Two semester hours of MUP 451 Repertoire and two semester hours of MUP 481 Performance Pedagogy and Materials are required.

Also required are two semester hours selected from MUP 453 Song Literature or 454 Song Literature or a repeated enrollment of MUP 451 Repertoire.

Diction. Three semester hours of MUP 250 Diction for Singers is required in Italian, German, and French.

Conducting. MUP 209 Beginning Choral Conducting is required.

Major Performing Medium. Sixteen semester hours of MUP 127 Studio Instruction and 16 semester hours of MUP 327 Studio Instruction are required to attain a proficiency level necessary to meet the graduation recital requirements. A half recital (MUP 495 Solo Performance) and a full recital (MUP 496 Solo Performance) are required.

Ensemble. Four different semesters of large vocal ensembles are required plus five semester hours of ensembles within five different semesters to be selected from large and/or small ensembles.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Language. Sixteen semester hours are required in more than one foreign language, chosen from French, German, and Italian. A student may select one year of one language and either one or two semesters of the other(s), chosen in conference with the advisor.

Additional Requirements. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

THEORY AND COMPOSITION—B.M.

Composition Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
MTC 321 Tonal Counterpoint	2
MTC 327 Form and Analysis I	3
MTC 432 Instrumentation	2
MTC 433 Orchestration	2
MTC 436 Electronic Studio Techniques I	2
Total	25

An additional five hours, to be selected from MTC 422, 425, 428, 429, 430, 437, and 441 are required.

Three semesters of MTC 123 Beginning Composition and four semesters of MTC 323 Composition are also required. At least three semesters of MTC 323 Composition must be taken at ASU.

Music History. Three semester hours of MHL 341 Music History and three semester hours of MHL 342 Music History are required.

Also required are three upper-division elective semester hours in music history, not to include MHL 447 Music Since 1900.

Conducting. Choose between the two combinations of courses: MUP 209 Beginning Choral Conducting and MUP 339 Choral Conducting *or* MUP 210 Beginning Instrumental Conducting and MUP 340 Instrumental Conducting.

Applied Music. Ten semester hours of study in applied music are required, at least eight of which must be in MUP 111 Studio Instruction.

Ensemble. Six semesters of participation in an ensemble are required.

Final Project. MTC 495 Final Project is required.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

Additional Requirements. At least four hours of electives to be chosen from MTC, MHL, or MUP (excluding courses taken to meet Class Piano proficiency) are required. MHL 447 Music Since 1900 may be used to satisfy the General Studies L requirement.

Theory Concentration

Music Theory. The following music theory courses are required:

MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
MTC 222 Music Theory: 19th Century	3
MTC 223 Music Theory: 20th Century	3
MTC 320 Modal Counterpoint	2
MTC 321 Tonal Counterpoint	2
MTC 323 Composition	2-3
MTC 327 Form and Analysis I	3
MTC 422 Musical Acoustics	3
MTC 425 Studies in 20th-Century Theory	3
MTC 428 Form and Analysis II	3
MTC 496 Theory Project	3
Total	33-34

Also required are 10 semester hours of electives in MTC courses at the 300 level or above, to be chosen in consultation with advisor.

Music History. Three semester hours of MHL 341 Music History and three semester hours of MHL 342 Music History are required.

Also required are three upper-division elective semester hours in music history, not to include MHL 447 Music Since 1900.

Conducting. Choose between the two combinations of courses: MUP 209 Beginning Choral Conducting and MUP 339 Choral Conducting *or* MUP 210 Beginning Instrumental Conducting and MUP 340 Instrumental Conducting.

Applied Music. Twelve semester hours of study in applied music are required, eight of which must be in MUP 111 Studio Instruction.

Ensemble. Eight semesters of participation in an ensemble are required.

Final Project. MTC 496 Theory Project is required.

Recital Attendance. Six semesters of MUP 100 Concert Attendance are required.

Language. The equivalent of 16 semester hours in one foreign language is required. The choice of language is subject to approval of advisor.

Diagnostic Examination. Four semesters of class piano (MUP 131, 132, 231, 232), unless waived by a diagnostic examination at the time of entrance, are required.

Additional Requirements. MHL 447 Music Since 1900 should be used to satisfy the General Studies L requirement.

MUSIC MINOR

The School of Music offers a minor in Music consisting of 20 semester hours of course work. A minimum grade of "C" is required in all courses.

MHL 341 Music History	3
MHL 342 Music History	3
MTC 125 Basic Music Theory	3
MTC 221 Music Theory: 18th Century	3
Electives	8
Total	20

Interested students should contact the School of Music for specific requirements and admission procedures.

GRADUATE PROGRAMS

The faculty in the School of Music offer graduate programs leading to the following degrees: Master of Arts, Master of Music, and Doctor of Musical Arts. Refer to the "Herberger College of Fine Arts Graduate Degrees and Majors" table, page 268, for a list of majors and concentrations. A document on graduate degree programs in music may be obtained by contacting the School of Music. See the *Graduate Catalog* for information on all graduate degrees.

MUSIC HISTORY/LITERATURE (MHL)

MHL 201 MacLiteracy for Musicians. (3)

fall, spring, summer

Instruction in basic Macintosh computer literacy, including generic applications and music-specific programs with hands-on experience. Lecture, lab.

General Studies: CS

MHL 341 Music History. (3)

fall and spring

Western music from the Greeks to the present day. Need not be taken in sequence with MHL 342. Prerequisite: MTC 221.

MHL 342 Music History. (3)

fall and spring

See MHL 341. Prerequisite: MTC 221.

MHL 344 Music in World Cultures. (3)

spring

Examines the relations among music, dance, theatre, religion, and social status in Asia, Africa, Oceania, Europe, and the United States.

General Studies: HU, G

MHL 352 The Evolution of Jazz. (3)

not regularly offered

Origin, development, and styles of jazz music and its exponents. Prerequisite: MTC 223.

General Studies: H

MHL 363 Survey of Russian Music. (3)

fall in odd years

Examines music and musical life in Russia, the Soviet Union, and the post-Soviet C.I.S. from the Middle Ages to the present. Lecture, discussion. Prerequisite: MHL 342 or instructor approval.

General Studies: HU

MHL 438 Music in the Classic Era. (3)

fall in even years

Development of the classic style of the 18th century; major works of Haydn, Mozart, and Beethoven. Prerequisites: MHL 341, 342; MTC 327.

General Studies: H

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MHL 439 Music in the 19th Century. (3)*spring*

European art music after Beethoven. Prerequisites: MHL 341, 342; MTC 327.

General Studies: L, H

MHL 441 Music of the Baroque Era. (3)*fall in odd years*

Works of major composers and stylistic tendencies of the period. Prerequisites: MHL 341, 342; MTC 327.

General Studies: L

MHL 447 Music Since 1900. (3)*fall and summer*

Survey of the works by major composers and stylistic trends. Prerequisites: MHL 341, 342; MTC 327.

General Studies: L

MHL 456 History of Opera. (3)*spring in odd years*

Development of opera from its creation c. 1600 to present. Emphasis placed on major stylistic developments and representative works. Prerequisites: MHL 341, 342; MTC 222.

MHL 466 North American Indian Music. (3)*spring in odd years*

Various styles of Indian music in the United States, Canada, and Mexico. Open to Music majors and nonmajors.

General Studies: L/HU, C

MHL 532 Music Bibliography. (3)*fall*

Major historical and analytical writings; systematic and historical collections of music. Reading knowledge of a foreign language recommended.

MHL 535 Medieval Music. (3)*spring in odd years*

Music of Europe in the Middle Ages, Gregorian chant, religious and secular monophony and polyphony to 1400.

MHL 536 Music of the Renaissance. (3)*spring in even years*

Music in Europe, with emphasis on stylistic concepts and changes, c. 1400–1580.

MHL 544 World Music I. (3)*fall in odd years*

Music of traditional and folk cultures of Africa, Europe, and the Americas.

MHL 545 World Music II. (3)*fall in even years*

Traditional, folk, and art music of the Pacific, Near East, and Asia.

MHL 547 Topics in American Music. (3)*not regularly offered*

Selected topics in the history of music. Composers working in the Americas with emphasis upon music since 1900.

MHL 557 Topics in Symphonic Literature. (3)*spring in even years*

Examines the evolution of the symphony and symphonic poem from the early classic era through the 19th century, with emphasis on the analysis of selected works.

MHL 564 History of Music Instruments. (3)*fall in even years*

Survey of the history and development of music instruments in traditional, folk, and art cultures.

MHL 566 Area Studies in Ethnomusicology. (3)*spring*

Study of the music of a particular culture, country, or area (e.g., music of Mexico, Latin America, China, Africa). May be repeated for credit.

MHL 568 Introduction to Ethnomusicology. (3)*fall in odd years*

Introduction to the theory and methodology of the discipline, including bibliography, fieldwork, transcription, analysis, and organology.

MHL 575 History of Choral Music. (3)*fall*

Major choral works.

MHL 591 Seminar. (1–12)*fall and spring***MHL 592 Research. (1–12)***fall and spring***MHL 599 Thesis. (1–12)***fall and spring***MHL 644 Notation of Polyphonic Music. (3)***spring in even years*

Music notation from the 15th through 17th centuries, including problems of transcription into modern notation.

MUSIC THEORY AND COMPOSITION (MTC)**MTC 123 Beginning Composition. (2)***fall and spring*

Intended for freshmen and sophomores in the composition concentration. Introduction to composing. May be repeated for credit. Prerequisite: instructor approval.

MTC 125 Basic Music Theory. (3)*fall and spring*

Notation, scales, keys, modes, intervals, chords, basic part writing. Development of related aural skills through sight-singing and dictation. Prerequisite: Music major or instructor approval.

MTC 221 Music Theory: 18th Century. (3)*fall and spring*

Styles, techniques, and idioms of 18th-century music; emphasis on analysis, composition (part writing), and related aural skills, with applications for performance. Prerequisite: MTC 125.

MTC 222 Music Theory: 19th Century. (3)*fall and spring*

Styles, techniques, and idioms of 19th-century music; emphasis on analysis, composition (part writing), and related aural skills, with applications for performance. Prerequisite: MTC 221.

MTC 223 Music Theory: 20th Century. (3)*fall and spring*

Styles, techniques, and idioms of 20th-century music; emphasis on innovative treatments of musical elements; related aural skills. Prerequisite: MTC 222.

MTC 315 Modern Arranging. (2)*fall*

Techniques in arranging for the contemporary jazz, radio, television, and studio orchestra. Prerequisite: MTC 223.

MTC 316 Modern Arranging. (2)*spring*

Continuation of MTC 315. Prerequisite: MTC 315.

MTC 320 Modal Counterpoint. (2)*fall*

Counterpoint based on 16th-century vocal polyphonic style. Prerequisite: MTC 221.

MTC 321 Tonal Counterpoint. (2)*spring*

Counterpoint based on 18th-century polyphonic style. Prerequisite: MTC 221.

MTC 323 Composition. (2–3)*fall and spring*

Writing music compositions, with emphasis on basic techniques and smaller structures. May be repeated for credit. Prerequisite: 3 semesters of MTC 123 or instructor approval.

MTC 327 Form and Analysis I. (3)*fall and spring*

Organizing elements in the most important contrapuntal and homophonic musical forms from the Renaissance through the 19th century. Prerequisite: MTC 222.

MTC 422 Musical Acoustics. (3)*fall*

Properties of sound and tone. Harmonic series, instruments, the ear, auditorium acoustics, and the reproduction of sound. Assumes a thorough knowledge of musical notation, intervals, scales, and harmony, or 2 years of music theory.

MTC 425 Studies in 20th-Century Theory. (3)*fall*

Continued development of analytical techniques and aural skill, with an examination of theoretical systems applicable to 20th-century music. Prerequisite: MTC 223.

MTC 428 Form and Analysis II. (3)*spring*

Organizing principles of the large forms of musical composition in the 19th and 20th centuries. Prerequisite: MTC 327.

MTC 429 Canon and Fugue. (2)*fall in odd years*

Writing of canons and fugues in tonal style. Prerequisite: MTC 321.

MTC 430 20th-Century Counterpoint. (2)*spring in even years*

Counterpoint studies utilizing 20th-century idioms. Prerequisite: MTC 223.

MTC 432 Instrumentation. (2)*fall in even years*

Study of the characteristics and performance techniques of individual orchestral instruments. Prerequisite: MTC 223.

MTC 433 Orchestration. (2)*spring in odd years*

Theoretical and practical study of scoring music for orchestra. Prerequisite: MTC 432.

MTC 436 Electronic Studio Techniques I. (2)*fall*

Principles of analog electronic music systems and their application in the composition of electronic music. Assumes a thorough knowledge of music notation and intervals.

MTC 437 Electronic Studio Techniques II. (2)*spring*

Principles of digital electronic music systems and their applications in the composition of electronic music. Prerequisite: MTC 436.

MTC 440 Jazz Theory and Ear Training. (2)*fall*

Advanced study of jazz harmonic systems. Daily oral drills. Prerequisite: MTC 223.

MTC 441 Jazz Composition. (2)*fall*

Creative writing in the smaller forms and in the idiom of jazz. Prerequisite: MTC 321.

MTC 495 Final Project. (0)*fall and spring*

Half recital of compositions or approval of a large-scale composition or a research paper.

MTC 496 Theory Project. (3)*fall and spring*

Supervised individual writing project dealing with music theory.

MTC 516 Baroque Music. (3)*spring in even years*

Detailed analysis of selected examples of music from the Baroque period.

MTC 517 Classic Music. (3)*spring in odd years*

Detailed analysis of selected examples of music from the Classic period.

MTC 518 Romantic Music. (3)*fall in even years*

Detailed analysis of selected examples of music from the Romantic period.

MTC 519 Late 19th-/Early 20th-Century Music. (3)*fall in odd years*

Detailed analysis of selected examples of music from the late 19th and early 20th centuries.

MTC 520 Analytical Techniques. (3)*spring and summer*

Analytical techniques systematically applied to music. Concentration on structural and compositional procedures.

MTC 523 Advanced Composition. (2–3)*fall and spring*

Advanced music composition, including complex techniques and larger structure. May be repeated for credit. Prerequisite: instructor approval.

MTC 525 Pedagogy of Theory. (3)*fall in even years*

Practices and principles of teaching music theory. Emphasizes most desirable and practical offerings possible. Comparative studies of existing practices.

MTC 527 History of Music Theory. (3)*not regularly offered*

Theory from Pythagoras to the 16th century. Need not be taken in sequence with MTC 528.

MTC 528 History of Music Theory. (3)*not regularly offered*

Theory from the 17th century to the present. Need not be taken in sequence with MTC 527.

MTC 555 Computer Music Notation. (2)*not regularly offered*

Instruction in preparing score and parts of music compositions using various music-notation software packages. Credit cannot be applied toward the graduate theory requirement. Lecture, lab. Prerequisite: instructor approval.

MTC 591 Seminar. (1–12)*fall and spring***MTC 592 Research. (1–12)***fall and spring***MTC 599 Thesis. (1–12)***fall and spring***MTC 647 Directions in New Music. (3)***not regularly offered*

Studies in contemporary idioms and aesthetics drawn from recent works of visiting composers; involves analytical discourse, critical writing, and applied concepts in composition. Lecture, discussion, exercise. Prerequisite: instructor approval.

MTC 723 Advanced Composition. (3)*fall and spring*

Special problems in writing in complex forms and textures. May be repeated for credit. Studio.

MTC 755 Music Composition Technology. (3)*not regularly offered*

Advanced study in digital sampling, synthesis, sequencing, computer-generated sound, and computer/performer interfaces. May be repeated for credit. Lecture, lab. Prerequisites: MTC 436 and 437 (or their equivalents).

MUSIC EDUCATION (MUE)**MUE 110 Introduction to Music Education. (1)***spring*

Overview of music education. Orientation to student characteristics, teacher roles, and foundations of philosophy and history. Requires school observations.

MUE 161 Introduction to Music Therapy. (2)*fall*

Overview of the profession of music therapy and its applications in mental health, rehabilitation, and special education.

MUE 211 Music in Recreation. (2)*fall*

Materials, methods, and organizational structures appropriate for recreational music. Prerequisite: ability to read music, as determined by the instructor.

MUE 261 Music Therapy as a Behavioral Science. (2)*fall*

Orientation to preclinical experience with emphasis on observation skills, assessment, goal setting, and professional ethics. Requires off-campus observations. Prerequisite: MUE 161.

MUE 310 Music in Early Childhood Education. (3)*spring*

Identifying and understanding musical needs of young children. Methods and materials for program development for classroom teachers.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MUE 311 Music for the Classroom Teacher. (3)*fall and spring*

Development of the classroom music program in the elementary school. No previous music experience or course work required. Prerequisite: non-Music major or minor.

MUE 313 Elementary Music Methods. (3)*fall*

Methods of instruction, planning, and presentation of appropriate contents in music. For music educators and music therapists. Prerequisite: Music major.

MUE 315 General Music in the Secondary Schools. (2)*fall and spring*

Curriculum, student characteristics, and teaching strategies for general music. Prerequisite: Music major.

MUE 317 Educational Methods for Violin and Viola. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 318 Educational Methods for Cello and String Bass. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 327 Educational Methods for Trumpet and Horn. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 328 Educational Methods for Trombone, Euphonium, and Tuba. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 335 Educational Methods for Guitar. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 336 Educational Methods for Percussion. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 337 Educational Methods for Flute, Clarinet, and Saxophone. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 338 Educational Methods for Double Reed Instruments. (1)*fall and spring*

Teaching and playing skills for music teachers. 3 hours per week.

MUE 361 Music Therapy Theory and Practice in Psychopathology. (3)*fall*

Influence of music on behavior; principles and practices of music therapy and psychiatric clients. Prerequisites: MUE 211, 261; Music Therapy major.

MUE 362 Music Therapy Techniques. (3)*spring*

Organization, administration, and use of music in rehabilitation with various client populations. Prerequisites: MUE 361; Music Therapy major.

MUE 381 Music Therapy Research. (3)*spring*

Statistics and research design appropriate for investigations in music therapy.

*General Studies: L***MUE 384 Therapy Preclinical I. (1)***fall and spring*

Paired students provide music therapy for small groups at a community agency for mentally retarded, geriatric, or physically disabled clients for a minimum of 10 clock hours. Prerequisites: MUE 211, 261.

MUE 385 Therapy Preclinical II. (1)*fall and spring*

Individual placement in ASU Music Therapy Clinic.

MUE 386 Therapy Preclinical III. (1)*fall and spring*

See MUE 385.

MUE 387 Therapy Preclinical IV. (1)*fall and spring*

Individual clinical work in a community mental health facility.

MUE 388 Therapy Preclinical V. (1)*fall and spring*

See MUE 387.

MUE 389 Repertoire for Music Therapy. (3)*spring*

Music skills repertoire for music therapy, including units on brass, strings, woodwinds, electronic instruments, computer music, and improvisation techniques. Lab. Prerequisites: MUE 211; Music Therapy major.

MUE 441 Psychology of Music. (3)*spring*

Psychological and physiological aspects of music emphasizing musical behavior, function, perception, and learning. Prerequisites: junior standing; Music Therapy major (or instructor approval).

MUE 475 Group Process and Music Therapy. (1)*fall*

Principles of group process, verbal counseling, professional writing, as related to music therapy practice. Prerequisites: MUE 362; Music Therapy major.

MUE 476 Internship in Music Therapy. (1)*fall and spring*

Full-time, 6-month, off-campus residency in an approved clinical institution.

MUE 480 Choral Methods. (3)*spring*

Methods of instruction, organization, and presentation of appropriate content in choral music classes. Prerequisite: Secondary Education major.

MUE 481 Instrumental Practicum/Methods. (5)*fall*

Instrumental music as a means of developing music skills, understandings, and attitudes in elementary and secondary school students. Prerequisite: Secondary Education major.

MUE 482 Instrumental Practicum/Methods. (5)*spring*

See MUE 481. Prerequisites: MUE 481 (or 485); Secondary Education major.

MUE 485 String Practicum/Methods. (2)*fall*

For students preparing to administer a string program and teach strings at the elementary level. Lecture, lab.

MUE 548 Introduction to Research in Music Education. (3)*fall and summer*

Introduction to historical, quantitative, and qualitative research methods and sources as they apply to research in music education.

MUE 549 Foundations of Music Education. (3)*once a year*

Historical/sociological survey of formal and informal music teaching and learning practices from the ancient Greeks to the present, including the evolution of philosophies and learning theories.

MUE 550 Studies in Music Curricula. (3)*once a year*

Scope and sequence of musical experiences. Development of criteria for the evaluation of music curricula.

MUE 551 Advanced Studies in Elementary School Music. (3)*once a year*

For experienced teachers; organization and content of the general music classes in kindergarten and the first 6 grades of elementary school. Emphasis on teaching music reading and ear training to young children.

MUE 552 Advanced Studies in Secondary General Music. (3)*once a year*

Organization and content of school music classes that are not performance oriented.

MUE 553 Contemporary Elementary Music. (3)*not regularly offered*

Identification and development of materials and techniques for teaching special units of music study to elementary (K-8) children.

MUE 560 Jazz Pedagogy. (3)*spring in odd years*

Study of pedagogy, repertoire, and technique of instruction in jazz styles, ensemble techniques, and performance practice for school ensembles. Lecture, lab, discussion, observation. Prerequisite: M.M., Music Education major.

MUE 562 Jazz Ensemble Rehearsal Techniques. (1)*fall and spring*

Conducting and rehearsal techniques for school jazz ensembles. Lab. Prerequisite: M.M., Music Education major.

MUE 564 Instrumental Music, Advanced Rehearsal Techniques. (3)*once a year*

In-depth analysis of instrumental techniques in preparation for a thorough discussion of band tuning problems and solutions. Discussion of productive conducting and rehearsal techniques for school music teachers.

MUE 566 Instrumental Literature for Schools. (3)*once a year*

Comprehensive study and analysis of all types of instrumental music.

MUE 568 Choral Music, Advanced Rehearsal Techniques. (3)*once a year*

Musical and vocal techniques necessary for presentation of choral literature. Analysis and experimentation with psychological, acoustical, and other problems of rehearsal and performance.

MUE 570 Choral Literature for Schools. (3)*once a year*

Comprehensive study and analysis of choral music for the high school with special emphasis on octavo literature.

MUE 579 Psychology of Music. (3)*once a year*

Nature of musicality and its evaluation. Review of recent research.

MUE 585 Vocal Acoustics and Production. (3)*once a year*

In-depth approach to the psychological/physiological workings of the vocal mechanism.

MUE 733 Contemporary Issues and Research in Music Education. (3)*once a year*

Emphasizes recent research relating to music instruction at all levels; current and historical issues in choral, general, and instrumental music.

MUE 744 Higher Education Instruction. (3)*once a year*

Philosophical and psychological principles of college/university teaching. Patterns of music teacher education and a projection of course outlines.

MUE 755 Historical Research in Music Education. (3)*summer*

Knowledge and insights related to conducting historical research in music education. Includes development of a mini-proposal for a dissertation on the history of music education.

MUSIC PERFORMANCE (MUP)**MUP 100 Concert Attendance. (0)***fall and spring*

Required of all music majors for 6 semesters in each degree program, with a minimum of 4 convocations attended each semester.

MUP 111 Studio Instruction. (2)*fall and spring*

Bassoon, cello, clarinet, contrabass, cornet, euphonium, flute, guitar, harp, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, voice. Minimum contact of 1 hour plus studio class weekly. May be repeated for credit. May not be taken for audit. Fee. Prerequisites: music major; placement examination; audition.

MUP 121 Studio Instruction. (1)*fall, spring, summer*

Secondary or minor instrument instruction. Bassoon, cello, clarinet, contrabass, cornet, euphonium, flute, guitar, harp, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, voice. Minimum contact of 1/2 hour per week. May be repeated for credit. May not be taken for audit. Fee. Prerequisites: music major; instructor approval.

MUP 127 Studio Instruction. (4)*fall and spring*

Bassoon, cello, clarinet, contrabass, cornet, euphonium, flute, guitar, harp, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, voice. Minimum contact of 1 hour plus studio class weekly. May be repeated for credit. May not be taken for audit. Fee. Prerequisites: Performance major; placement examination; audition.

MUP 130 Beginning Group Piano. (1)*fall and spring*

Provides a basic introduction to playing piano through music reading, chords, rhythmic, and written activities. Prerequisite: non-music major.

MUP 131 Class Piano. (1)*fall and spring*

4-semester sequence (with MUP 132, 231, and 232) designed for those with little or no piano experience. Emphasis on keyboard technique, sight reading, simple accompaniments, and improvisation. 2 hours per week. May not be taken for audit. Prerequisite: music major.

MUP 132 Class Piano. (1)*spring*

See MUP 131.

MUP 133 Class Voice. (1)*fall and spring*

4-semester sequence (MUP 134, 233, and 234) open to all students. 2 hours per week. May not be taken for audit.

MUP 134 Class Voice. (1)*fall and spring*

See MUP 133. Prerequisite: MUP 133 or instructor approval.

MUP 141 Jazz Fundamentals. (1)*fall*

Principles, methods, and theory of jazz performance, especially designed for the small jazz ensemble. 2 hours per week.

MUP 142 Jazz Fundamentals. (1)*spring*

Continuation of MUP 141. 2 hours per week.

MUP 209 Beginning Choral Conducting. (1)*fall and spring*

Essentials of choral conducting techniques. 2 hours per week.

MUP 210 Beginning Instrumental Conducting. (1)*spring*

Essentials of instrumental conducting techniques. 2 hours per week.

MUP 217 Improvisation Workshop. (2)*fall and spring*

Emphasis on basic jazz literature, chord symbol reading, melodic patterns, ear training, melodic concepts, and analysis of improvised solos. Must be taken in sequence with MUP 218. May not be taken for audit. Prerequisites: MTC 125; MUP 111 (1 semester).

MUP 218 Improvisation Workshop. (2)*fall and spring*

Continuation of MUP 217. Prerequisite: MUP 217.

MUP 231 Class Piano. (1)*fall*

See MUP 131.

MUP 232 Class Piano. (1)*spring*

See MUP 131.

MUP 233 Class Voice. (1)*fall and spring*

See MUP 133. Prerequisite: MUP 134 or instructor approval.

MUP 234 Class Voice. (1)*fall and spring*

See MUP 133. Prerequisite: MUP 233 or instructor approval.

MUP 235 Jazz Piano. (1)*fall*

2-semester sequence (with MUP 236) designed for jazz keyboard experience. Emphasis on chord symbol reading, simple improvisation, and voicing. 2 hours per week. Prerequisite: MUP 132.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MUP 236 Jazz Piano. (1)*spring*

See MUP 235. Prerequisite: MUP 132.

MUP 237 Fretboard Harmony. (1)*fall and spring*

Scales, chords, harmony, basic improvisation for the guitar. 2 hours per week.

MUP 250 Diction for Singers. (1)*fall and spring*

Use of phonetics in the study of song and opera literature. Language emphasis differs each semester. May be repeated for credit.

MUP 301 Advanced Class Piano. (1)*fall*

Required for the choral-general concentration of the Music Education major. Open to other music majors who have completed MUP 232.

Emphasis on accompaniments, ensemble playing, score reading, advanced harmonizations, repertoire, technique, and improvisation. 2 hours per week. May not be taken for audit. Prerequisites: MUP 232 (or proficiency); music major; placement examination.

MUP 302 Advanced Class Piano. (1)*spring*

Required for the choral-general concentration of the Music Education major. Open to other music majors who have completed MUP 301. A sequential continuation of MUP 301 skills that include both group and studio instruction. 2 hours per week. May not be taken for audit. Prerequisites: MUP 301 (or proficiency); music major; placement examination.

MUP 311 Studio Instruction. (2)*fall and spring*

See MUP 111. Fee.

MUP 319 Recording Studio Techniques. (2)*spring*

Study of both analog and digital recording methods. Includes lab time on recording console and tape machines. Lab.

MUP 320 MIDI Workshop. (2)*fall*

Presentation of hardware and software applications for sequencing and music printing. Lab.

MUP 321 Studio Instruction. (1)*fall, spring, summer*

See MUP 121. Fee.

MUP 327 Studio Instruction. (4)*fall and spring*

See MUP 127. Fee.

MUP 337 Studio Instruction: Piano Accompanying. (2)*spring*

Repertoire to be selected from vocal and instrumental literature. 1 hour lesson per week. May be repeated for credit. Prerequisites: Performance major with a concentration in piano accompanying; placement examination.

MUP 339 Choral Conducting. (2)*fall and spring*

Elements of choral conducting technique and interpretation. 3 hours per week. Prerequisite: MUP 209.

MUP 340 Instrumental Conducting. (2)*fall*

Fundamentals of score reading and interpretation of instrumental music. 3 hours per week. Prerequisite: MUP 210.

MUP 344 Chamber Orchestra. (1)*fall and spring*

Important masterpieces from all periods of music are performed throughout the year. May be repeated for credit. Prerequisite: audition with director.

MUP 345 Symphony Orchestra. (1)*fall and spring*

Over a 4-year period, the student is introduced to the masterpieces of symphony orchestra literature. 3 times per week. May be repeated for credit. Prerequisite: audition with director.

MUP 346 Sinfonietta. (1)*fall and spring*

Symphonic orchestra that presents approximately six concerts annually, performing masterpieces of the classical repertoire. 3 times per week. May be repeated for credit. Prerequisite: audition with director.

MUP 350 Choral Union. (1)*fall and spring*

Open to all students in the university and to interested singers in the community by audition. Preparation and performance of the larger choral works. 2 hours per week. May be repeated for credit. Prerequisite: audition with director.

MUP 352 Concert Choir. (1)*fall and spring*

Important masterpieces from all periods of music are performed. May be repeated for credit. Prerequisite: instructor approval.

MUP 353 University Choir. (1)*fall and spring*

4 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 355 Men's Chorus. (1)*fall and spring*

Rehearsal and performance of music for male voices. 3 hours per week. May be repeated for credit. Prerequisites: audition with director; instructor approval.

MUP 357 Women's Chorus. (1)*fall and spring*

2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 361 Marching and Concert Bands. (1)*fall and spring*

Staging of formations and drills for football games and other events (fall); masterpieces of symphonic band literature (spring). Meets daily. May be repeated for credit. Prerequisite: audition with director.

MUP 362 Wind Ensemble. (1)*fall and spring*

Rehearsal and performance of literature for wind ensemble. 2 hours per week in fall, 4 hours in spring. May be repeated for credit. Performing ensemble. Prerequisite: instructor approval.

MUP 363 Chamber Winds. (1)*fall and spring*

Rehearsal and performance of advanced literature for chamber winds. 2 hours per week. May be repeated for credit. Performing ensemble. Prerequisite: instructor approval.

MUP 370 Music Theatre: Techniques. (1)*fall and spring*

Exercises and improvisations for the singer/actor emphasizing body awareness, basic music theater performance skills, and freedom of the vocal and breath mechanisms. Section 1 (Movement for Singers); Section 2 (Expression); Section 3 (Interpretation); Section 4 (Advanced Expression); Section 5 (Advanced Interpretation). Sections 2 through 5 must be taken in sequence. Each section: 3 hours per week. May be repeated for credit.

MUP 371 Music Theatre: Workshops. (1)*fall and spring*

Development of specific skills for musical-dramatic interpretation. Section 1 (Aria Preparation); Section 2 (Broadway I); Section 3 (Broadway II). Each section: 1 hour lecture, demonstration, 1 lab per week. May be repeated for credit.

MUP 372 Music Theatre: Orchestras. (1)*fall and spring*

Participation in Lyric Opera Theatre productions. Section 1 (Orchestra); Section 2 (Chamber Orchestra); Section 3 (Chamber Ensemble). May be repeated for credit. Prerequisites: audition with director; instructor approval.

MUP 373 Music Theatre: Performance. (1)*fall and spring*

Participation in Lyric Opera Theatre productions. Section 1 (Principal Roles); Section 2 (Chorus). May be repeated for credit. Prerequisites: audition with director; instructor approval.

MUP 374 Music Theatre: Production. (1)*fall and spring*

Participation in Lyric Opera Theatre productions. Section 1 (Vocal Performance); Section 2 (Technical Music Theatre); Section 3 (Problems in Production) to be taken concurrently with MUP 373, Section 2. May be repeated for credit.

MUP 376 New Music Ensemble. (1)*fall and spring*

Rehearsal and performance of music written in the last 20 years. May be repeated for credit. Prerequisite: instructor approval.

MUP 377 Brass Choir. (1)*fall and spring*

Specializing in public performance of music written for brass instruments. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 379 Chamber Music Ensembles. (1)*fall and spring*

Brass, guitar, keyboard, mixed, percussion, string, vocal, and woodwinds ensembles. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 382 Collegium Musicum. (1)*not regularly offered*

Singers and instrumentalists specializing in the performance of early and unusual music. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 385 Percussion Ensemble. (1)*fall and spring*

Rehearsal and performance of standard and original repertoire for the percussion ensemble and related instruments. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 386 Jazz Band. (1)*fall and spring*

Rehearsal and performance of new, traditional, and Latin literature for jazz bands. 4 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 387 Ethnomusicology Ensembles. (1)*fall and spring*

Performance learning experience for the music of various cultures of the world. May be repeated for credit. Prerequisite: knowledge of instrument or instructor approval.

MUP 388 Piano Accompanying. (1)*fall and spring*

Piano accompaniments found in vocal and instrumental literature; discussion of styles and performance practices; experience in public performance. 2 hours per week. May be repeated for credit. Prerequisite: Performance major with a concentration in piano accompanying or instructor approval.

MUP 417 Advanced Improvisation. (2)*fall and spring*

Emphasis on analysis and performance of advanced jazz literature; composition in contemporary styles. Must be taken in sequence with MUP 418. May not be taken for audit. Prerequisite: MUP 218.

MUP 418 Advanced Improvisation. (2)*fall and spring*

Continuation of MUP 417. Prerequisite: MUP 417.

MUP 440 Keyboard Harmony. (1)*fall*

Performance-oriented class emphasizing chord progressions, harmonization, figured bass realization, stylistic improvisation, transposition, open score reading, and sight reading. Prerequisite: Performance major with a concentration in keyboard or instructor approval.

MUP 451 Repertoire. (2)*fall and spring*

Literature available for performance in all performing media. May be repeated for credit. Prerequisite: junior standing in major performance field.

MUP 453 Song Literature. (2)*once a year*

Early Italian, English, German, and French art song.

MUP 454 Song Literature. (2)*once a year*

American, Russian, Spanish, Scandinavian, and contemporary song.

MUP 481 Performance Pedagogy and Materials. (2)*fall and spring*

Principles and methods of performance techniques for each performance field. May be repeated for credit. Prerequisite: senior standing or instructor approval.

MUP 482 Piano Pedagogy. (2)*not regularly offered*

Continuation of MUP 481 (Piano). Problems and techniques of teaching intermediate to advanced piano students. Prerequisites: junior standing in Performance (keyboard or piano accompanying concentration); instructor approval.

MUP 487 Piano Accompanying. (1)*fall and spring*

Piano accompaniments found in vocal and instrumental literature; discussion of styles and performance practices; experience in public performance. 2 hours per week. May be repeated for credit. May not be taken for audit. Prerequisite: Performance major with a concentration in keyboard or piano accompanying.

MUP 495 Solo Performance. (0)*fall and spring*

For candidates of a B.M. degree in which 1/2 recital is a requirement. Prerequisite: B.M. degree candidate.

MUP 496 Solo Performance. (0)*fall and spring*

For candidates of a B.M. degree in which a full recital is a requirement. Prerequisites: B.M. degree candidate; MUP 495.

MUP 507 Group Piano Practicum. (2)*fall*

Curricula, materials, and teaching techniques for group teaching at the university and community college levels. Observation/supervised teaching in group piano.

MUP 508 Studio Observation. (1)*fall and spring*

Weekly observation of studio teaching by various piano faculty. Paper as final requirement. Prerequisite: M.M. piano student in Performance major (performance pedagogy or solo performance concentration).

MUP 509 Jazz Keyboard Harmony. (1)*fall*

Emphasis on jazz chords and chord progressions, harmonization, voicing, and analysis of transcriptions. Lab. Prerequisite: M.M., Music Education student.

MUP 510 Jazz Keyboard Harmony. (1)*spring*

Continuation of MUP 509. Lab. Prerequisite: MUP 509.

MUP 511 Studio Instruction. (2)*fall and spring*

Bassoon, cello, clarinet, contrabass, cornet, euphonium, flute, guitar, harp, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, voice. Minimum contact of 1 hour plus studio class weekly. May be repeated for credit. May not be taken for audit. Fee. Prerequisites: graduate music major; placement examination; audition.

MUP 517 Advanced Improvisation. (1)*fall*

Improvisation techniques within the context of advanced jazz literature. Must be taken in sequence with MUP 518. Lab. Prerequisites: placement examination; audition.

MUP 518 Advanced Improvisation. (1)*spring*

Continuation of MUP 517. Lab. Prerequisite: MUP 517.

MUP 521 Studio Instruction. (1)*fall, spring, summer*

Secondary or minor instrument instruction. Bassoon, cello, clarinet, contrabass, cornet, euphonium, flute, guitar, harp, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, voice. Minimum contact of 1/2 hour per week. May be repeated for credit. May not be taken for audit. Fee. Prerequisites: graduate music major; instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MUP 527 Studio Instruction. (2 or 4)*fall and spring*

Bassoon, cello, clarinet, contrabass, cornet, euphonium, flute, guitar, harp, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, voice. Minimum contact of 1/2 hour per week. May be repeated for credit. May not be taken for audit. Fee. Prerequisites: M.M., Performance major; placement examination; audition.

MUP 540 Advanced Conducting. (3)*fall*

Score preparation and conducting techniques for instrumental music. Concentration on study of historical styles. Required of D.M.A. students in Instrumental Music.

MUP 541 The Art Song. (3)*not regularly offered*

Seminar on solo song from its beginning to the present day.

MUP 544 Chamber Orchestra. (1)*fall and spring*

Important masterpieces from all periods of music are performed throughout the year. May be repeated for credit. Prerequisite: instructor approval.

MUP 545 Symphony Orchestra. (1)*fall and spring*

Masterpieces of symphony orchestra literature. 3 times per week. May be repeated for credit. Prerequisite: audition with director.

MUP 546 Sinfonietta. (1)*fall and spring*

Symphonic orchestra that presents approximately six concerts annually, performing masterpieces of the classical repertoire. 3 times per week. May be repeated for credit. Prerequisite: audition with director.

MUP 550 Choral Union. (1)*fall and spring*

Open to all students in the university and to interested singers in the community by audition. Preparation and performance of the larger choral works. 2 hours per week. May be repeated for credit. Prerequisite: audition with director.

MUP 551 Repertoire. (2)*fall and spring*

Literature available for performance in all performing media. May be repeated for credit.

MUP 552 Concert Choir. (1)*fall and spring*

Important masterpieces from all periods of music are performed. May be repeated for credit. Prerequisite: instructor approval.

MUP 553 University Choir. (1)*fall and spring*

4 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 555 Men's Chorus. (1)*fall and spring*

Rehearsal and performance of music for male voices. 3 hours per week. May be repeated for credit. Prerequisites: audition with director; instructor approval.

MUP 557 Women's Chorus. (1)*fall and spring*

2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 561 Marching and Concert Bands. (1)*fall and spring*

Staging of formations and drills for football games and other events (fall); masterpieces of symphonic band literature (spring). Meets daily. May be repeated for credit. Prerequisite: audition with director.

MUP 562 Wind Ensemble. (1)*fall and spring*

Rehearsal and performance of literature for wind ensemble. 2 hours per week in fall, 4 hours in spring. May be repeated for credit. Performing ensemble. Prerequisite: instructor approval.

MUP 563 Chamber Winds. (1)*fall and spring*

Rehearsal and performance of advanced literature for chamber winds. 2 hours per week. May be repeated for credit. Performing ensemble. Prerequisite: instructor approval.

MUP 570 Music Theatre: Techniques. (1)*fall and spring*

Exercises and improvisations for the singing actor emphasizing body awareness, isolations, and freedom of the vocal and breath mechanisms. Section 1 (Interpretation); Section 2 (Expression); Section 3 (Movement for Singers). Each Section: 3 hours per week. May be repeated for credit.

MUP 571 Music Theatre: Workshops. (1)*fall and spring*

Development of specific skills for the musical-dramatic interpretation. Section 1 (Role Preparation); Section 2 (Styles); Section 3 (Opera Scenes); Section 4 (Musical Comedy); Section 5 (Revue Ensembles). Each section: 1 hour lecture, demonstration, 1 lab per week. May be repeated for credit.

MUP 572 Music Theatre: Orchestras. (1)*fall and spring*

Participation in Lyric Opera Theatre productions. Section 1 (Orchestra); Section 2 (Chamber Orchestra); Section 3 (Chamber Ensemble). May be repeated for credit. Prerequisites: audition with director; instructor approval.

MUP 573 Music Theatre: Performance. (1)*fall and spring*

Participation in Lyric Opera Theatre productions. Section 1 (Principal Roles); Section 2 (Chorus). May be repeated for credit. Prerequisites: audition with director; instructor approval.

MUP 574 Music Theatre: Production. (1)*fall and spring*

Participation in Lyric Opera Theatre productions. Section 1 (Vocal Performance); Section 2 (Technical Music Theatre); Section 3 (Problems in Production) to be taken concurrently with MUP 573, Section 2. May be repeated for credit.

MUP 576 New Music Ensemble. (1)*fall and spring*

Rehearsal and performance of music written in the last 20 years. May be repeated for credit. Prerequisite: instructor approval.

MUP 579 Chamber Music Ensembles. (1)*fall and spring*

String, brass, woodwind, percussion, keyboard, vocal, and mixed ensembles. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 581 Performance Pedagogy and Materials. (2)*fall and spring*

Principles and methods of performance techniques for each performance field. May be repeated for credit.

MUP 582 Collegium Musicum. (1)*not regularly offered*

Singers and instrumentalists specializing in the performance of early and unusual music. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 585 Percussion Ensemble. (1)*fall and spring*

Rehearsal and performance of standard and original repertoire for the percussion ensemble and related instruments. 2 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 586 Jazz Band. (1)*fall and spring*

Rehearsal and performance of new, traditional, and Latin literature for jazz bands. 4 hours per week. May be repeated for credit. Prerequisite: instructor approval.

MUP 587 Ethnomusicology Ensembles. (1)*fall and spring*

Performance learning experience for the music of various cultures of the world. May be repeated for credit. Prerequisite: knowledge of instrument or instructor approval.

MUP 588 Piano Accompanying. (1)*fall and spring*

Piano accompaniments found in vocal and instrumental literature; discussion of styles and performance practices; experience in public performance. 2 hours per week. May be repeated for credit. Prerequisite: Performance major with a concentration in piano accompanying or instructor approval.

MUP 591 Seminar. (1–12)*not regularly offered*

MUP 595 Continuing Registration. (1)*fall and spring***MUP 596 Solo Performance. (1)***fall and spring*

May be full recital, major operatic role, solo performance with orchestra, ensemble, or lecture recital. Prerequisite: M.M. candidate in applied music.

MUP 597 Solo Performance. (1)*fall and spring*

See MUP 596.

MUP 671 Choral Repertoire. (3)*not regularly offered*

Examination of large choral/orchestral works to determine their musical and textual characteristics from a conductor's point of view.

MUP 727 Studio Instruction. (2 or 4)*fall and spring*

Minimum contact of 1 hour per week. May be repeated for credit. Fee. Prerequisite: D.M.A. candidate.

MUP 751 Seminar in Piano Literature. (2)*fall in odd years*

In-depth study of selected topics related to the standard piano literature. Requires research paper, bibliography, class presentation. Seminar.

MUP 792 Research. (1–12)*fall, spring, summer***MUP 796 Solo Performance. (1–15)***fall and spring*

May be repeated for credit. Prerequisite: D.M.A. candidate.

MUP 799 Dissertation. (1–15)*fall and spring***MUSIC (MUS)****MUS 100 Fundamentals of Music Notation. (3)***fall and spring*

Provides non-Music majors with sufficient symbol literacy to begin work in the field of musical learning. Credit not applicable toward any Music degree.

MUS 340 Survey of Music History. (3)*fall, spring, summer*

Major composers, compositions, and periods in the history of music. Credit not applicable toward any Music degree.

*General Studies: HU, H***MUS 347 Jazz in America. (3)***fall, spring, summer*

Current practices employed by contemporary jazz musicians; the historical development of jazz techniques. Credit not applicable toward any Music degree. Lecture, discussion. Cross-listed as AFH 347.

Credit is allowed for only AFH 347 or MUS 347.

*General Studies: HU***MUS 354 Popular Music. (3)***fall, spring, summer*

Emphasis on historical, cultural, and performance patterns in a variety of popular idioms such as, but not limited to, rock, folk, jazz, and Afro-American music. May be repeated for credit. Credit not applicable toward any Music degree.

*General Studies: HU***MUS 355 Survey of American Music. (3)***fall, spring, summer*

Growth and development of American music. Credit not applicable toward any Music degree.

*General Studies: HU, H***MUS 356 Survey of the Musical Theatre. (3)***once a year*

Music's place in the theatre, viewed in terms of historical importance and relative function. Credit not applicable toward any Music degree.

*General Studies: HU***Department of Theatre****(GHALL 232) 480/965-5359****herbergercollege.asu.edu/theatre****PROFESSORS**

BARKER, BEDARD, ECKARD, GINER, KNAPP, MASON, SALDAÑA, THOMSON, WILLS

ASSOCIATE PROFESSORS

ACKER, EDWARDS, ENGEL, HOLLOWAY, RISKE, VINING

ASSISTANT PROFESSORS

REYES, STERLING, WOODSON

LECTURERS

IRVINE, SMITH-DAWSON, TONGRET, WAGNER

The Department of Theatre is a member of the National Association of Schools of Theatre, and the requirements set forth in this catalog are in accordance with the published regulations of the association. For advising purposes, all students registering in a Theatre degree program enroll through the Herberger College of Fine Arts. Special advising check sheets, providing complete information regarding requirements and suggested electives, are available in the Department of Theatre office for each degree program.

Freshman and sophomores who meet university and departmental standards must receive a grade of "C" or higher in all major courses and a 2.50 cumulative GPA during their first semester to continue in the B.A. Theatre program. Students failing to meet these requirements will have one semester of departmental probation to receive a "C" or higher in major courses and raise their cumulative GPA to 2.50. Students failing to meet the above requirements by the end of the first year (two semesters) are asked to seek advising regarding other majors.

THEATRE—B.A.

The major in Theatre consists of 58 semester hours. The following 34 semester hours of core courses are required of all B.A. degree candidates:

THE 125	Orientation to Theatre	1
THE 220	Principles of Dramatic Analysis <i>L</i>	3
THE 320	History of the Theatre I <i>HU, H</i>	3
THE 321	History of the Theatre II <i>HU, H</i>	3
THE 440	Theatre Forms and Contexts	3
THP 102	Fundamentals of Acting	3
THP 217	Theatre Safety	1
THP 218	The Director's Vision	3
THP 301	Theatre Production: Running Crew	1
THP 301	Theatre Production*	1
THP 313	Scenography	3
THP 428	Theatre and the Future	3
Total	.....	28

* One semester hour in a different production option is required.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

One of the following two courses (three semester hours) is required:

THP 213 Introduction to Technical Theatre	3
THP 214 Introduction to Costuming	3

Three semester hours of departmental approved course work in developing new work is also required (e.g., play-writing, solo performance, theatre for social change). Check the department advising office for a list of eligible courses.

Twenty-four semester hours of THE and THP electives are selected between the student and advisor to complete the 58 semester hours required in the major. General Studies courses make up 45–48 semester hours of the total courses required.

Within the major (including related-area studies considered part of the major), only courses with a grade of “C” or higher may be applied toward graduation.

Before the junior year, students are evaluated on academic and artistic progress. Based on this evaluation, students may remain in the general B.A. degree program.

Additional elective courses in General Studies are selected with an advisor to meet the total 120 semester hours required for the degree.

Students who transfer 55 semester hours or more are required to enter with and retain a 2.50 GPA in theatre courses and a 2.00 cumulative GPA.

Electives. After satisfying all other requirements, remaining electives to total a minimum of 69 semester hours may be chosen with advisor approval from the list of approved General Studies courses or any courses in the Herberger College of Fine Arts. Lower-division courses in a foreign language may also be used as electives. See “College Degree Requirements,” page 267, for approved areas of study and the distribution of semester hours as required by the college.

GRADUATION REQUIREMENTS

In addition to fulfilling the major requirements, students must meet all university graduation requirements. See “University Graduation Requirements,” page 74.



Rehearsal of a scene from an ASU production of *Carousel*

Tim Trumble photo

MINOR

The department offers a minor in Theatre consisting of 22 semester hours of course work. The following courses are required:

THE 100 Introduction to Theatre <i>HU</i>	3
THE 320 History of the Theatre I <i>HU, H</i>	3
THE 321 History of the Theatre II <i>HU, H</i>	3
THP 101 Introduction to the Art of Acting.....	3
THP 213 Introduction to Technical Theatre	3
THP 301 Theatre Production.....	1
Concentration area*	6
Total	22

* Also required are two three-hour courses in the same area of concentration. Contact the department for options and course requirements.

Courses ordinarily limited to majors only are available to minors on a second-priority basis; that is, minors may not preregister for these courses, but are allowed to register after all majors' needs have been met. All prerequisites for the minor courses must be met (see course listings). Transfer students may transfer up to nine semester hours toward their minor.

GRADUATE PROGRAMS

The faculty in the Department of Theatre offer programs leading to the M.A. degree in Theatre; the Master of Fine Arts degree in Theatre with concentrations in performance, scenography, and theatre for youth; the Ph.D. degree in Theatre with a concentration in theatre for youth; and, in conjunction with the Department of English, an interdisciplinary Master of Fine Arts degree in Creative Writing (playwriting option). See the *Graduate Catalog* for details.

THEATRE (THE)**THE 100 Introduction to Theatre. (3)**

fall, spring, summer

Surveys theatre production from the Greeks to contemporary theatre. Taught in conjunction with distance learning. Lecture, discussion, guest artists. Prerequisite: nonmajor.

General Studies: HU

THE 125 Orientation to Theatre. (1)

fall

Orientation to university and department resources and procedures. Career planning and guidance. Attendance and written responses to theatre productions. Required for B.A. Theatre majors. Prerequisite: Theatre major.

THE 220 Principles of Dramatic Analysis. (3)

fall and spring

Analysis, evaluation, and interpretation of dramatic literature for theatrical production. Emphasis on the traditional canon of dramatic literature and traditional structures and forms of drama. Prerequisites: ENG 101 (or 105); Theatre major.

General Studies: L

THE 300 Film: The Creative Process I. (3)

fall, spring, summer

Elements of theatrical film: cinematography, sound, editing, directing, acting, scriptwriting, producing, and criticism. 3 hours lecture, demonstration via film and videotape.

General Studies: HU

THE 301 Film: The Creative Process II. (3)

fall and spring

Advanced study of selected films, analyzing cinematography, sound, editing, directing, acting, screenwriting, producing, and criticism. Prerequisite: THE 300.

THE 320 History of the Theatre I. (3)

fall

Traces major developments in theatre production and dramatic literature from their beginnings to the mid-17th century. Lecture, student presentations.

General Studies: HU, H

THE 321 History of the Theatre II. (3)

spring

Traces major developments in theatre production and dramatic literature from the mid-17th century to the 20th century. Lecture, student presentations.

General Studies: HU, H

THE 325 Play Reading for Educational Theatre. (1)

fall and spring

Assigned independent readings in plays for secondary school play production. Prerequisite: theatre education concentration or written instructor approval.

THE 400 Focus on Film. (3)

fall, spring, summer

Specialized study of prominent film artists, techniques, and genres. Emphasis on the creative process. May be repeated for credit. Prerequisite: ENG 101 or 105.

THE 402 Gender Identity in Film. (3)

fall, spring, summer

Examines the representation of gender in Hollywood cinema with particular focus on films from 1970 to the present. Prerequisite: THE 300.

THE 403 Independent Film. (3)

fall and spring

Examines independent films and filmmakers in the United States, 1968 to the present.

THE 404 Foreign Films and Filmmakers. (3)

once a year

Films and filmmakers from Europe, Asia, Australia, South America, and Caribbean. Emphasis on cultural content and filmmaking philosophies.

THE 405 Film: Great Performers and Directors. (3)

fall and spring

Examines processes and influences of one or more great film performers and/or directors. May be repeated for credit. Prerequisite: THE 300.

General Studies: HU

THE 420 History of the American Theatre. (3)

fall

History of the plays, artists, and events in the development of American theatre from colonial to modern times.

General Studies: HU, H

THE 421 History of the English Theatre. (3)

spring

History of the artists, events, and plays in the development of English theatre from medieval times to the present. Lecture, group and independent work. Prerequisite: THE 100 or 220.

General Studies: L/HU

THE 422 Latino and Latina Theatre. (3)

spring

Readings, discussion, video of dramatic literature and production styles of Latino/Latina playwrights and theatre companies in the United States. Prerequisites: both ENG 101 and 102 or only ENG 105.

THE 424 Trends in Theatre for Youth. (3)

not regularly offered

Surveys the history, literature, and contemporary practices in theatre for youth.

THE 425 History of Asian Theatre. (3)

not regularly offered

History and production techniques of theatre forms in India, China, and Japan. Prerequisite: 6 hours in theatre history or written instructor approval.

General Studies: L/HU

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

THE 430 History of Costume: Western Tradition. (3)*not regularly offered*

Studies major costume styles throughout history of Western civilization and how these fashions reflected society. Explores how styles can be used by theatrical costumers.

THE 431 History of Costume: Non-Western Tradition. (3)*not regularly offered*

Studies major costume styles of India, Asia, Eastern Europe, and the Middle East and how these fashions reflected society. Explores how styles can be used by theatrical costumers.

THE 440 Theatre Forms and Contexts. (3)*fall*

Explores 20th-century modernist theatrical forms and movements and development of alternative strategies for analyzing contemporary theatre and performance. Prerequisites: THE 220, 320, 321; Theatre major.

THE 480 Methods of Teaching Theatre. (4)*spring*

Applies materials, techniques, and theories for theatre with 9th-through 12th-grade students. Emphasis on curriculum development and praxis. Prerequisite: theatre education concentration or written instructor approval.

THE 500 Research Methods. (1–3)*fall*

Introduction to graduate study in theatre.

THE 504 Studies in Dramatic Theory and Criticism. (3)*fall*

Dramatic theory, criticism, and aesthetics from the classical period to the 19th century. Related readings in dramatic literature. Prerequisite: Theatre major.

THE 505 Studies in Dramatic Theory and Criticism. (3)*spring*

Dramatic theory, criticism, and aesthetics from the 19th century to the present. Related readings in dramatic literature. Prerequisite: Theatre major.

THE 510 Studies in Literature. (1)*fall and spring*

Assigned individual reading programs in standard sources and masterpieces in theatre literature. May be repeated for credit in different sections. Possible topics:

- (a) Acting–Directing
- (b) Criticism
- (c) Design–Technical
- (d) History

THE 520 Theatre History and Literature I. (3)*fall*

Surveys historiographical issues, historical periods, and theatre literature, through the 17th century.

THE 521 Theatre History and Literature II. (3)*spring*

Surveys historiographical issues, historical periods, and theatre literature, from the 17th century to present.

THE 524 Advanced Studies in Theatre for Youth. (3)*fall*

In-depth study of the history, literature, and contemporary practice of theatre for youth. Prerequisite: written instructor approval.

THE 591 Seminar. (3)*once a year*

Selected topics in child drama, community theatre, and theatre history. Prerequisite: written instructor approval.

THE 598 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) College Teaching

THE 692 Research. (1–12)*not regularly offered***THE 700 Advanced Research Methods. (3)***fall*

Critical review of research, development, and design of research in theatre and theatre for youth.

THE 791 Seminar. (3)*not regularly offered*

Selected topics offered on a revolving basis. May be repeated for credit when topics vary.

THEATRE PERFORMANCE AND PRODUCTION (THP)**THP 101 Introduction to the Art of Acting. (3)***fall, spring, summer*

Basic principles of acting. Topics include terminology, exercises, improvisation, and projects in acting. Prerequisite: nonmajor.

THP 102 Fundamentals of Acting. (3)*fall, spring, summer*

Actor awareness, imaginative physical and vocal preparation, scene and character analyses, terminology, application of truthful acting techniques, and monologue preparation. Studio. Prerequisite: Theatre major.

THP 113 Techniques of Theatrical Makeup. (3)*fall and spring*

Techniques of theatrical makeup: age, corrective, masks, and special effects. 1 hour lecture, 2 hours lab. Fee.

THP 194 Special Topics. (1–4)*once a year*

Possible topics:

- (a) Stage Management

THP 207 Acting: The Creative Imagination. (3)*fall*

Develops the actor as an artist, introducing the use of the creative imagination through sensory experience as led by Stanislavski. Studio. Prerequisite: instructor approval by interview. Prerequisite with a grade of "C" or higher: THP 102. Pre- or corequisite: THE 220.

THP 208 Acting: The Reality of Doing. (3)*spring*

Continuation of the inner process, applying the techniques of Meisner to discover the creativity in the spontaneous experience. Prerequisite: written instructor approval. Prerequisite with a grade of "B" or higher: THP 207.

THP 213 Introduction to Technical Theatre. (3)*fall and spring*

Procedures of technical theatre production and demonstration. Topics include design and construction of scenery, lighting, and properties. 2 hours lecture, 3 hours lab. Fee. Prerequisite: Theatre major or minor.

THP 214 Introduction to Costuming. (3)*fall and spring*

Basic principles of costume design, construction, and survey of selected historical periods including makeup styles. Costume design project and production experience. 3 hours lecture, 2 hours lab. Pre- or corequisites: THE 220; Theatre major.

THP 217 Theatre Safety. (1)*fall and spring*

Modern theatre safety practices including scene shop, chemical, electrical, and rigging safety. Prerequisite: Theatre major.

THP 218 The Director's Vision. (3)*fall and spring*

History, theory, and principles of directing. Examines director's role and responsibilities, play selection, conceptualizing, ground plans, blocking. Prerequisites: THE 220; THP 102.

THP 260 Introduction to Playwriting. (3)*fall and spring*

Basic skills of playwriting including exercises in monologues, scenes, and conflict and resolution, leading to completion of a one-act play. Prerequisite: ENG 101 or 105 or 107.

THP 261 Introduction to Screenwriting. (3)*once a year*

Basic skills of screenwriting including exercises in conflict and resolution, plot points, and theories of three-act structure and design. Prerequisite: ENG 101 or 105 or 107.

THP 272 Introduction to Stage Movement. (3)*fall and spring*

Movement vocabulary and physical training in relaxation, alignment, conditioning, rhythm, and poise. Prerequisite: THP 101 or written instructor approval. Pre- or corequisite: THP 102.

THP 277 Introduction to Voice for the Actor. (3)*fall and spring*

Exercises and techniques to free the voice and improve projection. Prerequisites: both THP 101 (or 102) and 272 or only written instructor approval. Prerequisite with a grade of "C" or higher: THE 220.

THP 285 Acting: Beginning Scene Study. (3)*fall and spring*

Character analysis, rehearsal, and performance of modern plays. Prerequisite with a grade of "C" or higher: THP 102 or instructor approval. Pre- or corequisite: THE 220.

THP 294 Special Topics. (1–4)*once a year*

Possible topics:

- (a) Introduction to Playwriting
- (b) Stage Management

THP 301 Theatre Production. (1–4)*fall, spring, summer*

Participation in university theatre productions. May be repeated for credit. Prerequisite: written instructor approval.

THP 307 Acting: Research and Performance. (1–3)*once a year*

Acting in theatre projects, productions, or collaborative performances in directing classes. May be repeated for credit. Prerequisite: instructor approval.

THP 308 Multiethnic Workshop. (3)*fall and spring*

Project-oriented workshop; provides the ethnic student and others the opportunity to develop and present works originating from America's ethnic cultures. Lecture, lab.

THP 311 Improvisation with Youth. (3)*fall and spring*

Basic materials, techniques, and theories for facilitating improvisational drama with children and youth. Not open to freshmen.

THP 312 Puppetry and Children. (3)*fall and spring*

Construction and manipulation of puppets; practice in performance skills. Emphasis on educational and recreational uses of puppetry by and with children. Fee. Prerequisite: junior standing or above.

THP 313 Scenography. (3)*fall and spring*

Art and practice of scenic, costume, and lighting design for the theatre and the media. Prerequisite: THP 213 or 214.

THP 317 Stage Management. (3)*fall*

Readings in stage management and participation as a stage manager in a university theatre production. Prerequisite: written instructor approval. Prerequisite with a grade of "C" or higher: THE 220.

THP 318 Directing for the Stage. (3)*fall and spring*

Director's approach to text analysis and articulation of ideas. Basic tools, rehearsal schedules, staging, rehearsal and audition techniques, scene work. Prerequisites: THP 213, 218; instructor approval.

THP 331 Costume Construction. (3)*not regularly offered*

Uses of materials and techniques for stage costumes with actual construction of period apparel. Prerequisite: THP 214 or instructor approval.

THP 340 Scene Design. (3)*fall and spring*

Studio projects in designing realistic scenery for the contemporary proscenium stage. Fee. Prerequisite: THP 213 or written instructor approval. Prerequisite with a grade of "C" or higher: THE 220.

THP 345 Lighting Design. (3)*fall and spring*

Principles and theory of stage lighting design, including design process and execution, equipment, and light plots. Lecture, lab. Fee. Prerequisite: THP 213 or written instructor approval. Prerequisite with a grade of "C" or higher: THE 220.

THP 350 Sound Design. (3)*fall*

Introduction to the equipment, process, and recording techniques used in sound design for the theatre. Lecture, studio. Fee. Prerequisite with a grade of "C" or higher: THE 220.

THP 360 Intermediate Playwriting. (3)*once a year*

Continued development of skills in playwriting through specific exercises and completion of a full-length play. Prerequisite: ENG 210 Introduction to Creative Writing (drama) or THP 260.

THP 377 Stage Speech. (3)*once a year*

Introduction of phonetic alphabet and standard speech and diction. Prerequisite: THP 277.

THP 385 Acting: Intermediate Scene Study. (3)*once a year*

Script analysis and performance of modern classics. Prerequisite: THP 377 or instructor approval.

THP 394 Special Topics. (1–4)*once a year*

Possible topics:

- (a) Beginning Screenwriting
- (b) Intermediate Playwriting
May be repeated for credit.
- (c) Stage Management

THP 401 Theatre Practicum. (1–3)*fall, spring, summer*

Production assignments for advanced students of technical production, stage and business management, and design. May be repeated for credit. Prerequisite: written instructor approval.

THP 406 Scenography. (3)*not regularly offered*

Process of production collaboration. Taught in conjunction with THP 519. Prerequisites: a combination of THP 214 and 340 and 345 or only instructor approval.

THP 411 Methods of Teaching Drama. (3)*fall*

Applies materials, techniques, and theories with grades K–8 youth. Regular participation with children. Prerequisite: THP 311 or written instructor approval.

THP 418 Directing the Actor. (3)*fall*

Practical applications of directing for the stage. Rehearsal and presentation of scenes and short plays. Prerequisites: THP 318; instructor approval.

THP 428 Theatre and the Future. (3)*fall and spring*

Capstone course exploring visions of the future of theatre. Results in a project in creative or scholarly form. Prerequisites: THE 440; senior status; Theatre major.

THP 430 Costume Design. (3)*not regularly offered*

Principles of costume design with projects in both modern and period styles. Includes budgets and fabric/pattern estimates. Lecture, studio. Prerequisite: THP 214.

THP 431 Advanced Costume Construction. (3)*once a year*

Specialized training in costume construction problems and crafts with projects in tailoring, millinery, and period accessories. Prerequisites: both THP 214 and 331 or only instructor approval.

THP 435 Advanced Technical Theatre. (3)*once a year*

Selection of materials, drafting of working drawings, tool operation, and construction techniques. 2 hours lecture, 2 hours lab. Prerequisites: both THP 340 and 345 or only written instructor approval.

THP 440 Advanced Scene Design. (3)*once a year*

Advanced studio projects in designing scenery for a variety of stage forms. Fee. Prerequisite: THP 340 or written instructor approval.

THP 441 Scene Painting. (3)*not regularly offered*

Studio projects in painting stage scenery. Fee. Prerequisite: THP 340 or written instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

THP 442 Drawing. (3)*not regularly offered*

Techniques in drawing and rendering for scenic, costume, and lighting design. Prerequisite: written instructor approval.

THP 444 Drafting for the Stage. (3)*not regularly offered*

Fundamentals of and practice in graphic techniques for the stage. Introduction to computer-aided design for the stage. 2 hours lecture, 3 hours studio. Fee. Prerequisites: THP 213; written instructor approval.

THP 445 Advanced Lighting Design. (3)*not regularly offered*

Specialized techniques in stage lighting. Advanced application of design process, graphic techniques of design presentation, and use of qualities of light. Lecture, class workshops. Fee. Prerequisite: THP 345 or written instructor approval.

THP 450 Theatre Organization and Management. (3)*not regularly offered*

Overview of nonprofit arts: organizational design, strategic planning, financial management, and leadership. Prerequisite: THE 220.

THP 460 Playwright's Workshop. (3)*fall and spring*

Practice and study of creating characters, dialogue, scenes, plays, and monologues for the stage. May be repeated for credit. Studio, lecture. Prerequisite: written instructor approval.

THP 461 Scripts in Progress. (3)*fall and spring*

Studio work with the instructor, centered on revisions of original plays. May be repeated for credit. Studio. Prerequisite: THP 460 or written instructor approval.

THP 472 Advanced Movement for the Stage. (3)*once a year*

Movement techniques for the classical and nonrealistic theatre; stage combat and special skills. Prerequisite: THP 272 or instructor approval.

THP 477 Advanced Speech for the Stage. (3)*once a year*

Exercises to develop vocal flexibility and power; mastery of elevated American diction and language skills applied to classical and nonrealistic drama; stage dialects. Prerequisite: THP 377.

THP 481 Secondary School Play Production. (3)*fall*

Methods of directing, designing, and coordinating play production experiences at the secondary school level. Off-campus practicum. Prerequisites: both THP 318 and theatre education concentration or only instructor approval.

THP 482 Theatre for Social Change. (3)*fall and spring*

Interactive theatre techniques (e.g., Boal, drama therapy, playback theatre) to examine and combat institutional, social, cultural, interpersonal, and personal oppressions. Lecture, lab.

*General Studies: C***THP 484 Internship. (1–4)***once a year***THP 485 Acting: Advanced Classical Scene Study. (3)***once a year*

Rehearsal and performance of period, classical, and nonrealistic plays. Emphasis on understanding poetic language and strong vocal and physical skills. Prerequisite: THP 385 or instructor approval.

THP 486 The Meisner Approach to Acting. (3)*once a year*

Improvisations and exercises developed by Sanford Meisner applied to scene work from selected texts. Studio. Prerequisite: introductory acting classes.

THP 487 Acting for TV and Film. (3)*once a year*

Professional television and film acting techniques, terminology, and on-camera experience. Studio. Prerequisite: THP 207 or 285.

THP 488 Audition Techniques. (3)*once a year*

Techniques and preparation for stage, commercial, and TV/film auditions utilizing monologues, cold readings, and personal style. Studio. Prerequisite: introductory acting classes.

THP 489 Actor Career Development. (3)*once a year*

Familiarization with the business of acting: self-promotional tools and techniques, marketing strategies, finances, interview skills, and actor unions. Studio. Prerequisite: introductory acting classes.

THP 494 Special Topics. (1–4)*once a year*

Possible topics:

- (a) Advanced Acting Techniques
- (b) Advanced Scene Painting
- (c) Advanced Screenwriting
- (d) Advanced Stage Management
- (e) Performance and Technology
- (f) Problems in Directing
- (g) Properties and Dressings Design and Construction
- (h) Solo and Collaborative Performance
- (i) Solo Performance
- (j) Stage Dialects
- (k) Standards in the School K–12
- (l) Storytelling
- (m) Technical Theatre
- (n) Theatre of the Oppressed
- (o) Theory and Practice of Performance
- (p) Video and Industrial Scene Design

THP 498 Pro-Seminar. (1–7)*once a year*

Possible topics:

- (a) Directing. (1–6)
- (b) Projects. (1–6)
 - Costume Design
 - Lighting Design
 - Properties Design
 - Scenery Design
 - Technical Direction
- (c) Stage Management. (1–6)
- (d) Theatre for Youth Tour. (1–6)
- (e) Theatre in Education. (1–6)

Prerequisite: written instructor approval.

THP 501 Performance: Solo Performance. (8)*once a year*

Students begin to define their mission in art. Emphasis on the actor as a solo storyteller, speaking as herself or himself. Studio. Prerequisite: instructor approval.

THP 502 Performance: Aesthetics of Theatre Art. (8)*once a year*

Understanding and analyzing scripts and performance in order to be an effective actor/storyteller who speaks as a character. Projects focus on solo, duet performances. Studio. Prerequisite: instructor approval.

THP 503 Performance: The Ensemble. (8)*once a year*

Ensemble, working with a playwright, creates a play that addresses social issues through improvisation and community input. Studio. Prerequisite: instructor approval.

THP 504 Acting: Transformation II. (8)*once a year*

Fundamentals including combat, scansion, poetic language, acting style. Scene study, ensemble performance projects focused on Shakespeare, new scripts. Studio. Prerequisite: THP 503 or written instructor approval.

THP 506 Scenography. (3)*not regularly offered*

Process of production collaboration. Taught in conjunction with THP 519. Fee. Prerequisite: theatre graduate standing or written instructor approval.

THP 507 Acting: Advanced Research and Performance. (1–3)*once a year*

Acting in advanced theatre projects, productions, or collaborative performance in directing classes. May be repeated for credit. Studio. Prerequisite: instructor approval.

THP 508 Multiethnic Workshop. (3)*fall and spring*

Advanced workshop for development and presentation of works originating out of American ethnic cultures. Lecture, lab.

THP 509 Singing for Actors. (1)*fall and spring*

Introduces the basics of singing technique. Breath control, resonance, articulation, exploration, and expansion of singing range. May be repeated for credit. Studio. Prerequisite: admission to M.F.A. performance concentration or written instructor approval.

THP 511 Improvisation with Youth Workshop. (3)*spring*

Theories and techniques of drama with various populations of youth. Emphasis on how research informs practice. Includes practicum. Prerequisites: only THP 411 or both graduate standing and written instructor approval.

THP 512 Puppetry Workshop. (3)*fall and spring*

Survey of puppetry in education, puppetry as an art form in design and performance. Fee. Prerequisite: graduate standing or written instructor approval.

THP 517 Stage Management Practicum. (3)*fall*

Readings and research in stage management and participation as a stage manager in a university theatre production. Prerequisite: written instructor approval.

THP 518 Advanced Directing Lab. (3)*fall and spring*

Active discovery of directing concepts through practical exercises and collaboration; deconstruction of contemporary/classic literature. Explores director as primary artist. Lab. Prerequisite: written instructor approval.

THP 519 Directing: Works in Progress. (3)*spring*

Advanced projects in directing concentrating on a collaborative process between director, playwright, actors, and designers. Focuses primarily on new scripts or adaptations of literature. May be repeated for credit. Studio, on-site practicum. Prerequisites: THP 418; instructor approval.

THP 530 Advanced Costume Design. (3)*not regularly offered*

Advanced studio projects in costume design for a variety of production forms. Prerequisite: written instructor approval.

THP 540 Scene Design Applications. (3)*once a year*

Conceptual and practical application of the design process including graphic and sculptural projects. Practical design problems investigated in laboratory. Lab fee. Prerequisite: written instructor approval.

THP 545 Lighting Design Applications. (3)*not regularly offered*

Advanced studio projects in stage lighting design. Prerequisite: written instructor approval.

THP 560 Playwright's Workshop. (3)*fall and spring*

Practice and study of creating characters, dialogue, scenes, plays, and monologues for the stage. May be repeated for credit. Studio. Prerequisite: written instructor approval.

THP 561 Scripts in Progress. (3)*fall and spring*

Studio work with the instructor centered on revisions of original plays. May be repeated for credit. Studio. Prerequisite: THP 560 or written instructor approval.

THP 562 Literary Management Workshop. (3)*fall*

Advanced literary management for the contemporary theatre, including trends in new play development, festivals and productions throughout the United States. Participation in Arizona Playwriting Competition. Prerequisite: THP 560 or written instructor approval.

THP 584 Internship. (1–3)*once a year*

Field research and on-site training in theatre for youth, community theatre, and production techniques. Prerequisite: written instructor approval.

THP 593 Applied Project. (1–12)*once a year*

Prerequisite: written instructor approval.

THP 594 Conference and Workshop in Child Drama. (3)*once a year*

Prerequisite: written instructor approval.

THP 598 Special Topics. (1–4)*once a year*

Lecture, studio. Possible topics:

- (a) Acting
- (b) Advanced Screenwriting
- (c) College Teaching:
 - Acting
 - Improvisation with Youth
 - Movement
 - Puppetry
 - Theatre for Social Change
 - Voice
- (d) Directing
- (e) Performance and Technology
- (f) Solo and Collaborative Performance
- (g) Solo Performance
- (h) Stage Dialects
- (i) Stage Management
- (j) Works in Progress:
 - Actor
 - Playwright

THP 611 Improvisation with Youth Seminar. (3)*once a year*

Examines current research, theory, and practices in drama with youth. Development and execution of research projects. Prerequisite: written instructor approval.

THP 618 Directing Practicum. (3)*once a year*

Practical experience in directing and producing an entire play or musical for young audiences. Prerequisite: written instructor approval.

THP 649 Design Studio. (3)*fall and spring*

Projects include design of scenery, costume, lighting, or sound for laboratory or mainstage productions. May be repeated for credit. Prerequisite: written instructor approval.

THP 684 Internship. (3–6)*fall, spring, summer*

Field research in performance, improvisation with youth, theatre for youth, puppetry, and scenography. Prerequisite: written instructor approval.

THP 691 Seminar: Scenography. (3)*not regularly offered*

Examines and researches modern concepts and practices of scenography. Prerequisite: written instructor approval.

THP 693 Applied Project. (1–12)*fall, spring, summer*

Final projects for M.F.A. Theatre candidates in performance, scenography, and theatre for youth. Prerequisite: written instructor approval.

THP 783 Field Work. (1–12)*once a year*

Possible topics:

- (a) Theatre Education

College of Law

Patricia D. White, J.D., Dean

www.law.asu.edu



The John J. Ross-William C. Blakley Law Library

Tim Trumble photo

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PURPOSE

The prime function of the College of Law is to train men and women for the practicing legal profession and related professional assignments. In addition, the college has the responsibility to contribute to the quality of justice administered in our society.

ORGANIZATION

Law Building and Law Library

The John S. Armstrong Law Building is located near other colleges on the university's main campus. The Law Building provides every modern facility for legal education and has been described by experts involved in the planning of law buildings as setting a new standard in functional design.

The award-winning John J. Ross-William C. Blakley Law Library, named in memory of two prominent Phoenix attorneys, is one of the finest law libraries in the Southwest. The library houses a collection of more than 351,000 volumes and microform volume equivalents. The collection includes a broad selection of Anglo-American case reports and statutes as well as legal treatises, periodicals, encyclopedias, digests, citators, and administrative materials. The collection also includes a growing selection of special materials dealing with international law, Indian law, Mexican law, and law and technology.

The library, housed in a dramatic and functional building that opened in August 1993, is also a selective U.S. government depository. The building provides accessible shelving for the expanding collections and comfortable study space at carrels, tables, and lounge seating located throughout the library. Additionally, the law library has a 30-station computer lab as well as LEXIS and WESTLAW rooms which contain 10 stations each; 27 meeting and study rooms; a microforms facility; and a classroom.

Students also have ready access to the other campus libraries, including the Charles Trumbull Hayden Library, the Daniel E. Noble Science and Engineering Library, the Architecture and Environmental Design Library, and the Music Library. The collections maintained in all university libraries comprise more than 3 million volumes.

Special Programs

Center for the Study of Law, Science, and Technology. The ASU Center for the Study of Law, Science, and Technology is a multidisciplinary research center founded by the Arizona Board of Regents in 1984. The center publishes research studies, sponsors seminars and symposia, and houses visiting scholars and teachers. Through these programs, the center seeks to contribute to

1. the formulation and improvement of law and public policy affecting science and technology; and

2. the wise application of science and technology in the legal system.

The College of Law offers a substantial number of courses in the law, science, and technology area including bioethics, law and psychiatry, environmental law, health care law, intellectual property, land use regulation, law and evolutionary biology, law and medicine, law and social science, mass communication, natural resources law, patent law, regulatory problems in law, science and technology, and water law. Each semester, the center publishes a student guide to other less obvious courses that contain science and technology issues. In recent semesters this guide has listed courses in AIDS and the law, commercial law, employment law, law and the handicapped, antitrust, statistical proof in employment discrimination litigation, and several courses offered by other departments on campus available for registration by law students. In addition to regular course offerings, students can arrange independent studies with supervising faculty on topics of special interest to them. The center also invites guest speakers from legal or scientific fields to visit with interested law students, generally during the noon hour.

In cooperation with the American Bar Association Section on Science and Technology and under the leadership of a faculty editor, second- and third-year students edit *Jurimetrics: The Journal of Law, Science and Technology*. Student editors both edit submitted works and write original articles for publication in the journal.

Clinical Programs. The College of Law's Clinical Program is a rigorous in-house program that provides third-year students, under the close supervision of an ASU faculty member, the opportunity to represent clients in court. Four live-client clinics, the Civil Practice Clinic, the Criminal Practice Clinic, the Public Defender Clinic, and the Mediation Clinic, provide students with an opportunity to choose from civil or criminal representation or to serve as mediators in disputes that are resolved outside the court system.

The Civil Practice Clinic operates as a functioning law firm within the college, while Criminal Practice and Public Defender Clinic students work in offices located within agencies or courthouses. Second-year students are offered "simulation-based" courses in Lawyering Theory and Practice in preparation for enrollment in a live-client clinic. Other simulation courses include Trial Advocacy, Pre-Trial Practice, and Negotiation.

Indian Legal Program. The College of Law offers an Indian Legal Program intended to serve tribal courts and governments by providing information on legal issues. The program also provides education and generates scholarship on Indian law. Through a Certificate in Indian Law, the college provides its students with a quality legal education and an opportunity to gain specific knowledge and expertise in Indian law.

Students at the College of Law have the opportunity to participate in all phases of the Indian Legal Program and gain an in-depth understanding of the legal issues affecting Indian tribes and people. Courses on Federal Indian law and seminars on advanced Indian law topics such as tribal law, economic development, American Indian cultural resources protection, and tribal environmental law are part of the curriculum. Students also have the opportunity to participate in internships with local tribal courts, the Native American

Rights Fund, the U.S. Department of the Interior, or the Senate Committee on Indian Affairs in Washington, D.C. This variety of academic and work experience provides the students with an outstanding legal education and a firm grounding in both the theoretical and practical aspects of Indian law.

ADMISSION

First-year students are admitted only for the fall semester. The formal requirements for admission to the College of Law are (1) an undergraduate degree from an accredited four-year college or university and (2) a score on the Law School Admission Test (LSAT), administered by Law Services, Box 2000, Newtown, Pennsylvania 18940, in centers throughout the country.

For more information regarding admission, call 480/965-1474 or write

ADMISSIONS OFFICE
COLLEGE OF LAW
ARIZONA STATE UNIVERSITY
PO BOX 877906
TEMPE AZ 85287-7906

Retention Standards. To be eligible to continue in the College of Law, students must maintain a cumulative weighted GPA of 70 or higher at the end of each semester or summer session. Any student who fails to achieve a 70 GPA in any one semester, regardless of the cumulative GPA, is automatically placed on probation. Continuation of enrollment by probationary students is upon such terms and conditions as the college may impose.

A student whose cumulative GPA falls below the required level or whose semester GPA is less than 70 in two consecutive semesters is dismissed but may apply to the Office of the Dean for readmission. The Office of the Dean refers the application to a faculty Committee on Readmission. Cases in which the GPA deficiency is slight and evidence of extenuating circumstances is convincing, readmission may be granted on a probationary status after a review of the reasons contributing to unsatisfactory performance and a finding that there is substantial prospect for acceptable academic performance. Continuation in school thereafter may be conditioned on achieving a level of performance higher than the overall 70 GPA. Further detailed information concerning the college's retention standards can be found in the *Bulletin of the College of Law*.

Honor Code. The legal profession, a self-regulating association, depends on the integrity, honor, and personal morality of each member. Similarly, the integrity and value of an ASU College of Law degree depends on a reputation for fair competition. The college's *Honor Code* is intended as a measure to preserve the integrity of the school's diploma and to create an arena in which students can compete fairly and confidently. Copies of the *Honor Code* are available from the assistant dean in the college's Student Services Office.

ACCREDITATION

The college is fully accredited by the American Bar Association and is a member of the Association of American Law Schools.

MORE INFORMATION

Further detailed information concerning the course of study, admission practices, expenses, and financial assistance can be found in the *Bulletin of the College of Law*. To request the bulletin or application forms, call 480/965-7207 or write

ADMISSIONS OFFICE
COLLEGE OF LAW
ARIZONA STATE UNIVERSITY
PO BOX 877906
TEMPE AZ 85287-7906

For general information about the College of Law, call 480/965-1474 or access the college's Web site at www.law.asu.edu.

Law

Doctoral Program

Patricia D. White
Dean
(LAW 201) 480/965-6181
law.asu.edu

REGENTS' PROFESSORS

KAYE, MURPHY

PROFESSORS

ARTERIAN, BARTELS, BENDER, BERCH, BRENNAN,
CALLEROS, ELLMAN, FELLER, FURNISH, GREY,
GUERIN, JONES, KADER, KARJALA, LESHY,
LOWENTHAL, MATHESON, O'GRADY, ROSE,
SCHROEDER, STANTON, STROUSE, TESÓN, TSOSIE,
TUCKER, WEINSTEIN, WHITE, WINER

SENIOR CLINICAL PROFESSIONAL

DAUBER

CLINICAL PROFESSIONAL

DALLYN

DIRECTORS

Center for the Study of Law, Science, and Technology
Strouse

Clinical Programs

O'Grady

Indian Legal Program

Tsosie

Legal Research and Writing and Academic Support
Stinson

JURIS DOCTOR DEGREE

The College of Law offers a three-year program of professional studies at the graduate level leading to the degree of Juris Doctor.

For more information on the degree and courses, see the *Graduate Catalog*.

Course of Study

The program of study in the College of Law is designed for full-time students. In the first year of the three-year program, the course of study is prescribed and incorporates the time-proven techniques of legal education. This first year gives students—by the “case method,” by the “problem method,” by “moot court,” and through other techniques—an intensive exposure to the basic legal processes.

As a part of the program, first-year students are assigned to small sections. In the Legal Research and Writing program, first-year students prepare legal briefs and memoranda and receive feedback through the use of practice examinations. The program focuses on the development of writing and organizational skills necessary for success in law school and in the practice of law. The second and third years cover a wide range of courses varying in format as well as subject matter, allowing students to pursue both the basic subjects of law study and more specialized interests. By offering great freedom in the selection of subjects, the educational experience of the second and third years is in sharp contrast to the curriculum of the first year. In addition, the college offers a number of faculty-supervised clinical education programs and a program of supervised externships.

LAW (LAW)

See the *Graduate Catalog* for the LAW courses.



Inside John S. Armstrong Hall

Tim Trumble photo

College of Liberal Arts and Sciences

Linell E. Cady, Th.D., Interim Dean

www.asu.edu/clas



Palm Walk, a notable landmark on the ASU campus

Tim Trumble photo

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PURPOSE

Like all major research universities, Arizona State University provides the means for undergraduates to acquire a liberal education, an education that broadens students' understanding in the major areas of human knowledge while providing students with in-depth knowledge in their chosen areas of focus. While the professional schools and colleges can and do provide for important dimensions of a liberal education, the central academic setting for accomplishing this basic university purpose is the College of Liberal Arts and Sciences (CLAS). The college provides a particularly rich and varied set of opportunities for students to gain the kind of liberal education that helps to prepare them for a lifetime of continued learning and application of knowledge in a diverse and ever-changing world.

As a consequence of the wide range of subjects CLAS offers in the humanities, the natural sciences and mathematics, and the social and behavioral sciences, instruction is provided in a number of core areas for undergraduate students from all of the other colleges. Students with majors in business, education, engineering, nursing, and other professional colleges rely on CLAS for basic foundation courses. CLAS also offers the majority of courses meeting the General Studies requirement.

CLAS initiated and continues to participate actively with the Barrett Honors College. It also offers advising to undergraduates who are working out their undergraduate programs or are planning for graduate studies.

Most of the university faculty's engagement in the discovery and creation of knowledge and its dissemination occurs in CLAS. As an integral part of this activity, CLAS offers a wide range of graduate training programs leading to a master's or doctoral degree. For graduate degree application information, see the *Graduate Catalog* and contact either the Graduate College or the academic unit in which the degree of interest would be earned, the latter in order to receive detailed information on particular degree requirements.

ORGANIZATION

CLAS consists of 23 academic departments, several interdisciplinary programs, seven centers, and several research institutes and laboratories. The college offers 37 programs leading to a bachelor's degree, 28 programs leading to a master's degree, 22 programs leading to a doctoral degree, and interdisciplinary graduate programs in cooperation with other colleges. Undergraduate customized interdisciplinary degrees are also available in the college.

For more information, access the college's Web site at www.asu.edu/clas.

ADMISSION

Any entering ASU student who has met the minimum university entrance requirements can be admitted to CLAS. Students with fewer than 50 earned hours of credit can, if they wish, be admitted as "no preference" students. Students with 50 or more hours must declare a major to be accepted into the college.

Any student with a cumulative GPA of at least 2.00 who is currently registered in good standing in another college at ASU and who wishes to major in a subject offered by CLAS and to follow a program of study in the major may transfer

into the college. (Students wishing to transfer into the majors of Computer Science or Economics must have an ASU cumulative GPA of at least 2.50.) The student transfers by applying and being initially advised in the Office for Academic Programs in SS 111. Students admitted from other ASU colleges are under mandatory advising during the first semester and must take courses leading directly to a degree in CLAS. Failure to follow mandated advice on course selection can result in enrollment and registration problems, including cancellation and holds.

Transfer Students. The university standards for evaluation of transfer credit are listed under "Transfer Credit," page 57. All students who meet the university standards are admissible to CLAS, but students desiring to major in either Computer Science or Economics must have transfer GPAs of at least 2.50. Transfer students are urged to contact the relevant academic department or the Office for Academic Programs in SS 111, to ensure a smooth transition to CLAS. Students who have transferred courses from institutions other than Arizona community colleges must have their transcripts evaluated by an advisor in SS 111. Students who have attended only Arizona community colleges have evaluations performed in the department of the major.

Courses transferred from two-year (community) colleges are accepted as lower-division credit only. Students are urged to choose their community college courses carefully, in view of the fact that a minimum of 45 semester hours of work taken at the university must be upper-division credit (see "Community Colleges," page 57).

"Undecided" or "Undeclared" Majors. Students in CLAS are not required to select a major upon entering the college as freshmen or at any time thereafter until the semester in which 60 semester hours are earned. Until such "no preference" students have chosen a major, they are advised through Cross-College Advising Services, in the Undergraduate Academic Services Building. It is important to consult an academic advisor before any enrollment activity. Before or during the semester in which they earn 60 semester hours, students *must* select their major and transfer into the appropriate department.

Note: Students who wish to enter a program of study that has a rigidly structured curriculum should be aware that delay in choosing a major could result in added time and cost in the completion of requirements.

ADVISING

All students are urged to seek advising in the appropriate college unit before registration. Students must follow the calendar published in the *Schedule of Classes* each semester for information regarding enrollment, adding/dropping classes, and withdrawals.

In addition to information provided by an advisor, students must read the requirements for university General Studies, college graduation, and major degree requirements in this edition of the ASU *General Catalog*. See "General Studies," page 78, "University Graduation Requirements," page 74, "CLAS Graduation Requirements," page 320, and the section of the department offering the major. The ASU *General Catalog* is the governing source for all degree requirements.

Regular Advising. All students are strongly urged to seek advising in the appropriate college unit before registration.

Advising Locations. CLAS students should seek routine advising at the locations shown in the “Advising Locations” table, on this page.

The Office for Academic Programs, in SS 111, is the central resource center for academic information in the college. Requests from students, departmental advisors, and faculty for clarification of rules, procedures, and advising needs of the college and university should be directed to that office.

Advising Locations

Student	Location
Declared majors	Department of major
No preference;	Cross-College Advising Services,
no preference, prelaw	UASB (480/965-4464)
No preference,	LSC 206C (480/965-2365)
premedical	

Mandatory Advising. The following categories of Liberal Arts and Sciences students *must* receive advising and *must* be cleared on the Mandatory Advising Computer System (MACS) before their classes are scheduled:

1. students in their first semester at ASU;
2. students on probation;
3. students with a cumulative GPA of less than 2.00;
4. students who have admissions deficiencies;
5. other students with “special admissions” status; and
6. students who have been disqualified (these students are allowed to attend ASU summer and winter sessions only and must be advised in the Office for Academic Programs in SS 111).

Students in the above mandatory advising categories should consult an advisor in the appropriate advising location listed in the previous section. Students with admission deficiencies are carefully monitored to ensure that they take courses that eliminate their deficiencies. Students are encouraged to check their mandatory advising status each semester before attempting registration transactions.

Advising for Preprofessional Programs. Special advising is available for students planning to enter the fields listed in the “Advising for Preprofessional Programs” table, on this page. The professional programs shown in the table are not majors in themselves; that is, there are no majors called “premedical,” “prelaw,” etc. In each program, the student must eventually select an established major in CLAS or in one of the other colleges.

DEGREES

Majors. Programs leading to the B.A. and B.S. degrees are offered by CLAS, with majors in the subjects listed in the “College of Liberal Arts and Sciences Baccalaureate Degrees and Majors” table, page 318. Each major is administered by the academic department indicated.

Advising for Preprofessional Programs

Professional Field	Office Where Advisor Is Located
Dentistry ^{1,2}	Pre-Health Professions, LSC 206C
Foreign service	Department of chosen major
Health physics	Pre-Health Professions, LSC 206C
Law	Office for Academic Programs, SS 111
Medicine ¹	Pre-Health Professions, LSC 206C
Ministry	Department of Religious Studies, LL 641
Occupational therapy ¹	Pre-Health Professions, LSC 206C
Optometry ^{1,2}	Pre-Health Professions, LSC 206C
Osteopathy ¹	Pre-Health Professions, LSC 206C
Pharmacy ¹	Pre-Health Professions, LSC 206C
Physical therapy ¹	Pre-Health Professions, LSC 206C
Podiatry ^{1,2}	Pre-Health Professions, LSC 206C

¹ Students preparing for a career in these areas should register in the Pre-Health Professions office, 480/965-2365.

² No school in Arizona offers a program in dentistry, optometry, or podiatry. Students interested in pursuing these professions should confer with the Pre-Health Professions advisor concerning out-of-state schools where they may complete their training.

Minors. Although not required for graduation, special college-approved minors are available in most departments. Check department program descriptions for details. Minors offered by departments must have at least 18 hours of designated courses, including at least 12 hours of upper-division work. The college requires a grade of at least “C” in all upper-division courses in the minor. Some departments have stricter requirements. A minimum of six upper-division hours in the minor must be taken in residence at ASU Main.

University policies prohibit the “double-counting” of courses from the major for the minor. Specific questions concerning double-counting, as well as general questions about the approval processes for minors, should be taken up with an academic advisor in the department offering the minor or the Office for Academic Programs in SS 111.

Refer to the CLAS portion of the “ASU Minors” table, page 104.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university’s three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see “ASU Extended Campus,” page 683, or access the Web site at www.asu.edu/xed.

College of Liberal Arts and Sciences Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
African American Studies	B.A.	Humanities/arts, politics and society, social and behavioral sciences	African American Studies Program
Anthropology	B.A.	—	Department of Anthropology
Asian Languages (Chinese/Japanese)	B.A.	—	Department of Languages and Literatures
Biochemistry	B.S.	—	Department of Chemistry and Biochemistry
Biology	B.S.	Biology and society	Department of Biology
Chemistry	B.A., B.S.	—	Department of Chemistry and Biochemistry
Chicana and Chicano Studies	B.A.	Humanities/cultural sciences, social sciences/policy	Department of Chicana and Chicano Studies
Clinical Laboratory Sciences	B.S.	—	Department of Microbiology
Computer Science	B.S. ^{1, 2}	—	Department of Computer Science and Engineering
Conservation Biology	B.S.	—	Department of Biology
Economics	B.A., B.S. ³	—	Department of Economics
English	B.A.	Linguistics, literature	Department of English
Exercise Science/Physical Education	B.S.	Exercise science, physical education	Department of Exercise Science and Physical Education
Family and Human Development	B.S.	Family studies/child development	Department of Family and Human Development
French	B.A.	—	Department of Languages and Literatures
Geography	B.A., B.S.	Meteorology-climatology, urban studies	Department of Geography
Geological Sciences	B.S.	—	Department of Geological Sciences
German	B.A.	—	Department of Languages and Literatures
History	B.A.	—	Department of History
Humanities	B.A.	—	Interdisciplinary Humanities Program
Integrated Studies	B.A., B.S.	—	College of Liberal Arts and Sciences
Italian	B.A.	—	Department of Languages and Literatures
Mathematics	B.A.	—	Department of Mathematics
	B.S.	Computational mathematical sciences	Department of Mathematics
Microbiology	B.S.	—	Department of Microbiology
Molecular Biosciences/Biotechnology	B.S.	—	Departments of Microbiology and Plant Biology
Philosophy	B.A.	—	Department of Philosophy
Physics	B.S.	—	Department of Physics and Astronomy
Plant Biology	B.S.	Environmental science and ecology, plant biochemistry and molecular biology, urban horticulture	Department of Plant Biology
Political Science	B.A.	—	Department of Political Science
	B.S.	Public policy advocacy and lobbying, public policy analysis	Department of Political Science
Psychology	B.A., B.S.	—	Department of Psychology
Religious Studies	B.A.	—	Department of Religious Studies
Russian	B.A.	—	Department of Languages and Literatures
Sociology	B.A.	—	Department of Sociology
Spanish	B.A.	—	Department of Languages and Literatures
Speech and Hearing Science	B.S.	—	Department of Speech and Hearing Science
Women's Studies	B.A.	—	Women's Studies Program

¹ The department is in the College of Engineering and Applied Sciences, which also offers this major, with different requirements.

² This major requires more than 120 semester hours to complete.

³ The department is in the College of Business, which also offers this major, with different requirements.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements. For complete information, see “University Graduation Requirements,” page 74.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 hours of approved course work in General Studies, as described in “General Studies,” page 78. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

General Studies courses are listed in the “General Studies Courses” table, page 81, in the course descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

COLLEGE DEGREE REQUIREMENTS

CLAS degree requirements are more extensive than the General Studies requirement. Additional course work in the humanities, natural sciences and mathematics, and social and behavioral sciences is required. Students are encouraged to consult with an academic advisor in planning a program to ensure that they meet all necessary requirements.

To graduate from CLAS, a student must satisfy college requirements in addition to university General Studies requirements. These requirements consist of *major requirements* which involve concentrated course work in a selected field; and *CLAS graduation requirements* which ensure that the student demonstrates proficiency in a second language while exposing the student to other liberal arts and sciences outside the major field.

I. Major Requirements. Each student is required to select a major from among the fields of study offered by CLAS. The requirements for completion of the major are described under departmental listings.

- A. The major department may require up to 45 semester hours of course work. The minimum is 30 hours. A maximum of 15 additional hours may be required in related courses and prerequisites. No more than 60 semester hours of course work may be required to complete the major, related courses, and prerequisites. Some departments require calculus-level mathematics; up to five of these semester hours may be excluded from the 60-hour maximum because they satisfy the mathematics proficiency requirement. A minimum of 12 upper-division hours in the major must be taken in residence at ASU Main.
- B. No credit is granted toward fulfilling major or minor requirements in any upper-division course in that subject field unless the grade in that course is at least a “C.” In CLAS, the assignment of a grade of “Y” indicates a level of performance that would have resulted in a grade of at least “C” had the normal grading scheme been used.

In addition, each major in CLAS requires students to earn a “C” minimum in the math course used to meet the General Studies math requirement. Please see the individual departments for other minimum grade requirements.

- C. Major fields of study are classified into the following three divisions:
 1. Humanities:
 - African American Studies (AFH)
 - Asian Languages (Chinese/Japanese) (CHI/JPN)
 - Chicana and Chicano Studies (CSH)
 - English (Linguistics students must take two upper-division literature or film courses to meet CLAS graduation requirements in Humanities.) (ENG)
 - French (FRE)
 - German (GER)
 - Humanities (HUM)
 - Italian (ITA)
 - Philosophy (HPS, PHI)
 - Religious Studies (REL)
 - Russian (Only meets CLAS graduation requirements in Humanities if at least two upper-division literature or civilization courses are taken.) (RUS)
 - Spanish (SPA)
 - Women’s Studies (WSH)
 2. Natural sciences and mathematics:
 - Biochemistry (BCH)
 - Biology (BIO)
 - Chemistry (CHM)
 - Clinical Laboratory Sciences (CLS)
 - Computer Science (CSE)
 - Conservation Biology (BIO)
 - Geological Sciences (GLG)
 - Mathematics (MAT)
 - Microbiology (MIC)
 - Molecular Biosciences/Biotechnology (MBB)
 - Physics (AST, PHS, PHY)
 - Plant Biology (PLB)
 3. Social and behavioral sciences:
 - African American Studies (AFS)
 - Anthropology (ASB, ASM)
 - Chicana and Chicano Studies (CSS)
 - Economics (ECN)
 - Exercise Science/Physical Education (Students majoring in this field must satisfy the CLAS graduation requirements in all three divisions.) (EPE)
 - Family and Human Development (Students majoring in this field must satisfy the CLAS graduation requirements in all three divisions.) (CDE, FAS)
 - Geography (GCU)
 - History (HST)
 - Political Science (POS)
 - Psychology (PGS, PSY)
 - Sociology (SOC)
 - Speech and Hearing Science (Students majoring in this field must satisfy the CLAS graduation requirements in all three divisions.) (SHS)
 - Women’s Studies (WST)

II. CLAS Graduation Requirements. The purpose of the CLAS graduation requirements is to ensure that the student is introduced to disciplines outside the division of the major. A list of major fields and their respective divisions is given under I.C.

Unless the major field notes otherwise in I.C., students are considered to have fulfilled the CLAS graduation requirements in the division of the major.

Students majoring in Exercise Science/Physical Education, Family and Human Development, and Speech and Hearing Science must satisfy CLAS graduation requirements in social behavioral sciences as well as in the other two divisions. Students majoring in African American Studies or Chicana and Chicano Studies satisfy either the CLAS graduation requirements in the humanities or the social and behavioral sciences, depending upon their concentrations.

Students majoring in Anthropology, Geography, or Psychology may not use ASM courses in the case of Anthropology majors, GPH courses in the case of Geography majors, or PSY courses in the case of Psychology majors to satisfy the CLAS graduation requirements in the natural sciences and mathematics.

Note: Courses used to fill the university General Studies requirement may not be used to fill CLAS graduation requirements in the humanities, social and behavioral sciences, and the natural sciences and mathematics.

A. Humanities (six semester hours). Each student is required to complete two upper-division courses of at least three semester hours each. Course prefixes are identified in the following section.

Course prefixes for the CLAS graduation requirement in the Humanities:

1. AFH (African American Studies Program)
2. CSH (Department of Chicana and Chicano Studies)
3. ENG (Department of English; any literature course, including ENG 200 and 218)
4. CHI, FLA, FRE, GER, GRK, HEB, ITA, JPN, LAT, POR, RUS, SCA, SPA (Department of Languages and Literatures; FLA 150 or any literature or "civilization" course at the 200 level or above that is not also used to meet the language proficiency requirement)
5. HUM (Interdisciplinary Humanities Program)
6. HPS, PHI (Department of Philosophy)
7. REL (Department of Religious Studies)
8. WSH (Women's Studies Program)

B. Natural sciences and mathematics (six semester hours). Each student is required to complete two courses of at least three semester hours each.

Course prefixes for the CLAS graduation requirements in the natural sciences and mathematics:

1. ASM (Department of Anthropology)
2. BIO (Department of Biology)
3. BCH, CHM (Department of Chemistry and Biochemistry)

4. CSE (Department of Computer Science and Engineering)
5. GPH (Department of Geography)
6. GLG (Department of Geological Sciences)
7. MAT, STP (Department of Mathematics)

Note: Only mathematics courses for which MAT 117 or a higher-level mathematics course is a prerequisite may be used to satisfy the CLAS graduation requirements in Natural Sciences and Mathematics.

8. MIC (Department of Microbiology)
9. AST, PHS, PHY (Department of Physics and Astronomy)
10. PLB, MBB (Department of Plant Biology)
11. PSY (Department of Psychology)

C. Social and behavioral sciences (six semester hours). Each student is required to complete two upper-division courses of at least three semester hours each. Course prefixes of approved courses are identified in the following section.

Course prefixes for the CLAS graduation requirements in the social and behavioral sciences:

1. AFS (African American Studies Program)
 2. ASB (Department of Anthropology)
 3. CSS (Department of Chicana and Chicano Studies)
 4. ECN (Department of Economics)
 5. GCU (Department of Geography)
 6. HST (Department of History)
 7. PGS (Department of Psychology)
 8. POS (Department of Political Science)
 9. SOC (Department of Sociology)
 10. WST (Women's Studies Program)
- Note:* Before the 1999–2000 edition of the *General Catalog*, all Women's Studies courses were listed as WST. Consult an advisor to verify if an earlier WST course should be considered WSH or WST.

D. Bridge course requirement (three semester hours). Each student is required to complete one CLAS bridge course of at least three semester hours. Bridge courses contain substantial content that bridges at least two of the areas of inquiry noted in sections A., B., and C. Bridge courses cannot be double counted to fill other requirements for the university or college. If a student wishes to use a bridge course listed below to fill a humanities, social science, or natural science requirement, he or she must select another course from the list to fill the bridge requirement.

The following courses have been approved as CLAS bridge courses (see an advisor for any additional bridge courses approved after the *General Catalog* was published):

- BIO 311 Biology and Society
- BIO 319 Environmental Science
- BIO 427 Fire

ENG 312	English in a Social Setting
ENG 494	Science and Literature Across the Cultural Divide
EPE 452	Exercise Psychology
GCU 344	Geography of Hispanic Americans
GPH 314	Global Change
GPH 405	Energy and Environment
GPH 422	Plant Geography
HST 460	History of Fire
SCA 250	Introduction of Scandinavian Culture
PLB 322	Environmental Science
PSY 424	Generic Psychology
PSY 425	Biological Bases of Behavior
PSY 426	Neuroanatomy
PSY 433	Human Psychophysiology
PSY 470	Psychopharmacology
REL 379	Religion, Nationalism, and Ethnic Conflict
REL 382	Religion, Magic, and Science
REL 390	Women and Religion
REL 480	Religion and Modern Global Politics
SOC 334	Technology and Society
SOC 390	Social Statistics
SOC 420	Sociology of Religion
SOC 451	Comparative Sociology
SOC 483	History of Social Thought

E. Each student is required to demonstrate proficiency by completing courses in a second language. Each student must demonstrate proficiency by completing the courses specified below with a grade of “C” or higher in each course. Second language course requirements consist of

1. completion of second language course work at the intermediate level (202 or equivalent, though some languages require both semesters at the intermediate level to be taken to demonstrate proficiency; see the Department of Languages and Literatures listings for greater specification);
2. a foreign language course at the 300 level or higher taught in the foreign language and having 202 or its equivalent as a prerequisite;
3. completion of secondary education at a school in which the language of instruction is not English; or
4. completion of SHS 202 American Sign Language IV or its equivalent.

III. General Electives. Most CLAS majors can meet all of the above requirements with fewer than 120 semester hours required for graduation. The remaining hours are general electives that may be selected from any of the departments of CLAS and from the offerings of the other colleges.

Program of Study/Declaration of Graduation. The program of study/declaration of graduation, which is required by university regulations during the semester in which an undergraduate earns the 87th hour, must be filed and

approved at least two weeks before the preregistration period for the subsequent semester. Students are expected to follow the approved program of study or to receive early college approval for proposed changes to the program of study. Students should contact the Office for Academic Programs, in SS 111, regarding college graduation rules and deadlines. Deadlines for filing a program of study/declaration of graduation after enrolling in the 87th hour are March 1 and October 1 of each year. Students with 87 hours must have a college-approved program of study/declaration of graduation before registering for the next semester.

Credit Requirement. All candidates for graduation in the B.A. and B.S. degree curricula are required to complete at least 120 semester hours, of which at least 45 hours must consist of upper-division courses. A minimum ASU cumulative GPA of 2.00 is required for graduation.

Course Load. The normal course load is 15–16 semester hours. First-semester freshmen and entering transfer students are not permitted to register for more than 18 semester hours in the initial semester. Other students who wish to register for more than 18 hours must have a GPA of at least 3.00 and must file a petition in the Office for Academic Programs, in SS 111, before registration. Any petition for an overload in excess of 21 hours must be presented to the Standards Committee of the college. No student should assume that his or her petition will be granted for overload.

SPECIAL CREDIT OPTIONS

Pass/Fail Grade Option. The pass/fail grade option is intended to broaden the education of Liberal Arts and Sciences undergraduates by encouraging them to take advanced courses outside their specialization. A mark of “P” contributes to the student’s earned hours but does not affect the GPA. A failing grade is computed into the GPA.

Only CLAS students with at least 60 semester hours may take courses under the pass/fail option. The option may be used under the following conditions:

1. enrollment for pass/fail needs the approval of the instructor and the college;
2. enrollment under this option must be indicated during registration and may not be changed after the late registration period; and
3. a maximum of 12 hours taken for pass/fail may be counted toward graduation.

Students may not enroll under the pass/fail option in the following courses:

1. those taken to satisfy the second language or First-Year Composition requirements;
2. those in the student’s major, minor, or certificate program;
3. those counted toward or required to supplement the major;
4. those counted as 499 Individualized Instruction;
5. those taken for honors credits; or
6. those counted toward satisfying the CLAS graduation requirements or the General Studies requirement.

College of Liberal Arts and Sciences Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Anthropology	M.A. ¹	Archaeology, bioarchaeology, linguistics, medical anthropology, museum studies, physical anthropology, social-cultural anthropology	Department of Anthropology
	Ph.D.	Archaeology, physical anthropology, social-cultural anthropology	Department of Anthropology
Asian Languages and Civilizations—Chinese/Japanese	M.A.	—	Department of Languages and Literatures
Biology ²	M.S., Ph.D.	Ecology	Department of Biology
Chemistry	M.S., Ph.D.	Analytical chemistry, biochemistry, geochemistry, inorganic chemistry, organic chemistry, physical chemistry, solid-state chemistry	Department of Chemistry and Biochemistry
Communication Disorders	M.S.	—	Department of Speech and Hearing Science
Creative Writing	M.F.A. ³	—	Creative Writing Committee
English	M.A.	Comparative literature, English linguistics, literature and language, rhetoric and composition	Department of English
	Ph.D.	Literature, rhetoric/composition and linguistics	Department of English
Exercise Science	Ph.D. ³	Biomechanics, motor behavior/sport psychology, physiology of exercise	Committee on Exercise Science
Exercise Science/ Physical Education	M.S.	—	Department of Exercise Science and Physical Education
Family and Human Development	M.S.	Family studies	Department of Family and Human Development
Family Science ²	Ph.D.	Marriage and family therapy	Department of Family and Human Development
French	M.A.	Comparative literature, linguistics, literature	Department of Languages and Literatures
Geography	M.A., Ph.D.	—	Department of Geography
Geological Sciences	M.S., Ph.D.	—	Department of Geological Sciences
German	M.A.	Comparative literature, language and culture, literature	Department of Languages and Literatures
History	M.A.	Asian history, British history, European history, Latin American history, public history, U.S. history, U.S. Western history	Department of History
	Ph.D.	Asian history, British history, European history, Latin American history, U.S. history	Department of History
Humanities	M.A.	—	Graduate Committee on Humanities
Materials Science ³	M.S.	—	Committee on Science and Engineering of Materials
Mathematics	M.A., Ph.D.	—	Department of Mathematics
Microbiology	M.S., Ph.D.	—	Department of Microbiology
Molecular and Cellular Biology	M.S., Ph.D.	—	Interdisciplinary Committee on Molecular and Cellular Biology

¹ Graduate students in the School of Justice Studies and the Department of Anthropology are able to receive a concurrent M.S. degree in Justice Studies and M.A. degree in Anthropology.

² This major has formalized concentration(s); other areas of study are available.

³ This program is administered by the Graduate College.

College of Liberal Arts and Sciences Graduate Degrees and Majors (continued)

Major	Degree	Concentration	Administered By
Natural Science	M.N.S.	Biology Chemistry Geological Sciences Mathematics Microbiology Physics Plant biology	Department of Biology Department of Chemistry and Biochemistry Department of Geological Sciences Department of Mathematics Department of Microbiology Department of Physics and Astronomy Department of Plant Biology
Philosophy	M.A., Ph.D.	—	Department of Philosophy
Physical Education	M.P.E.	—	Department of Exercise Science and Physical Education
Physics	M.S., Ph.D.	—	Department of Physics and Astronomy
Plant Biology ²	M.S., Ph.D.	Ecology, photosynthesis	Department of Plant Biology
Political Science	M.A., Ph.D.	American politics, comparative politics, international relations, political theory	Department of Political Science
Psychology	Ph.D.	Behavioral neuroscience, clinical psychology, cognitive/behavioral systems, developmental psychology, environmental psychology, quantitative research methods, social psychology	Department of Psychology
Religious Studies	M.A.	—	Department of Religious Studies
Science and Engineering of Materials	Ph.D. ³	High-resolution nanostructure analysis, solid-state device materials design	Committee on Science and Engineering of Materials
Sociology	M.A., Ph.D.	—	Department of Sociology
Spanish	M.A. Ph.D.	Comparative literature, language and culture, linguistics, literature Cultural studies, literature	Department of Languages and Literatures Department of Languages and Literatures
Speech and Hearing Science	Ph.D. ³	Developmental neurolinguistic disorders, neuroauditory processes, neurogerontologic communication disorders	Committee on Speech and Hearing Science
Statistics	M.S. ³	—	Committee on Statistics
Teaching English as a Second Language	M.TESL	—	Department of English

¹ Graduate students in the School of Justice Studies and the Department of Anthropology are able to receive a concurrent M.S. degree in Justice Studies and M.A. degree in Anthropology.

² This major has formalized concentration(s); other areas of study are available.

³ This program is administered by the Graduate College.

Audit Grade Option. A student may choose to audit a course in which he or she attends regularly scheduled class sessions but earns no credit. The student should obtain the instructor's approval before registering for the course. For more information, see "Grading System," page 67.

Note: This grade option may not be changed after the drop/add period.

Independent Learning. Study by independent learning is not a normal part of a degree program; special circumstances must exist for a resident student to take independent learning courses. Any enrollment in such courses must have the prior approval of the college.

ACADEMIC STANDARDS

The standards for GPA and the terms of probation, disqualification, reinstatement, and appeal are identical to those of the university as set forth under "Retention and Academic Standards," page 71, except that the disqualified student in CLAS is suspended for at least two regular semesters at the university. When students are placed on probation, one of three things can happen:

1. the student may raise his or her cumulative GPA to a 2.00 or better by taking new classes and be removed from probation after the fall or spring semester;
2. the student may receive the required semester GPA, but not raise the cumulative GPA to the 2.00 level in which case, the student may continue on probation,

earning the required semester GPA, for as many semesters as it takes to raise the cumulative GPA above 2.00; or

3. the student may fail to achieve the required semester GPA and be disqualified.

Students with cumulative GPAs of less than 2.00 who leave the university for a semester or more are not automatically readmitted. Such students, as well as all disqualified students, should contact the Office for Academic Programs in SS 111, regarding procedures and guidance for reinstatement and returning to good standing. By following recommendations and meeting established standards for summer school work or course work at other institutions, the possibility of successful reinstatement is enhanced. Academic discipline is one of the functions of the Office for Academic Programs. All students having academic difficulties of any kind should contact this office. Also available in this office is information on policies and procedures of the college on academic honesty, student grievances with respect to grades, and various petitions regarding college standards and graduation requirements.

Academic honesty is expected of all students in all examinations, papers, academic transactions, and records. The possible sanctions include, but are not limited to, appropriate grade penalties, loss of registration privileges, disqualification, and dismissal.

STUDENT RESPONSIBILITIES

Any student enrolling in courses offered by CLAS is expected to follow the rules and deadlines specified in this catalog and the current *Schedule of Classes*. Students are urged to meet with their departmental academic advisors before registration. Students with additional questions or problems are also urged to meet with advisors in the Office for Academic Programs, in SS 111, regarding the academic rules of the college and the university.

SPECIAL PROGRAMS

Barrett Honors College. CLAS works closely with the Craig and Barbara Barrett Honors College, which affords qualified undergraduates opportunities for enhanced educational experiences. For a complete description of requirements and opportunities, see “The Craig and Barbara Barrett Honors College,” page 112.

Integrated Studies. An Integrated Studies major leading to the B.A. or B.S. degree provides students of outstanding ability in the humanities, natural sciences and mathematics, and social and behavioral sciences opportunities to pursue courses of studies that cut across departmental boundaries and focus on specific topics or problem areas. Completion of 32 semester hours at ASU with a GPA of at least 3.25 and three letters of recommendation from ASU faculty members are required for admission. For more information about degree requirements, visit the Office for Academic Programs in SS 111.

Washington Semester Program. Students have a variety of opportunities for practicum and internship experiences that enable them to meld classroom learning with practical application. Among the several individual departmental programs that provide internships for majors, the Department of Political Science is the ASU sponsor of the Washington

Semester Program. The program provides students a one-semester opportunity to study in Washington, D.C., through any one of several programs sponsored by the American University. The program is available to outstanding juniors or seniors and requires careful planning with an academic advisor early in the student’s career. For more information, call the Department of Political Science at 480/965-6551.

Military Officer Training. The Departments of Aerospace Studies and Military Science offer programs leading to commissions in the armed forces, but they do not offer majors or minors. For more information, see the appropriate department descriptions in this catalog.

Certificate Programs and Areas of Emphasis

Certificates are available from numerous units in CLAS, and one collegewide Enriched College Degree Certificate is available to any major in the college as shown in the “CLAS Certificates” table, page 325. Areas of emphasis are also available in some of the same subjects (e.g., Latin American Studies).

Enriched College Degree. CLAS offers an Enriched College Degree Certificate, available to any major within the college.

The Enriched College Degree Certificate consists of a minimum of 15 semester hours of a minimum of “C” grade credit. The certificate consists of

1. a theme track composed of a three-course sequence outside the student’s major, characterized by an identifiable theme of intellectual relevance for students;
2. a bridge course selected to address the relationships among areas of inquiry and means of acquiring knowledge; and
3. an upper-division course in spoken English to provide a meaningful opportunity for substantive oral presentations.

For more information, visit the CLAS Office for Academic Programs, in SS 111, or call 480/965-6506.

American Public Policy. See “Certificate in American Public Policy,” page 431.

Asian Studies. An Asian Studies Certificate is offered through the Center for Asian Studies.

Students must complete two years (20 semester hours) of an Asian language plus 30 additional hours of Asian-area studies courses selected from core Asian studies courses or courses with a significant focus on Asia chosen in consultation with the Center for Asian Studies advisor. Students whose native language is an Asian language or who have otherwise mastered an Asian language may elect to take four additional Asian studies courses in place of the elementary and intermediate language classes. Language requirements may be selected from Chinese, Indonesian, Japanese, Korean, Thai, and Vietnamese.

An East Asian Studies Certificate is also available. Students must complete two years (20 semester hours) of Chinese or Japanese plus 30 additional semester hours of East Asian area studies courses; these courses must be selected from the core East Asian curriculum or must be courses with a significant focus on East Asia chosen in consultation with the Center for Asian Studies director.

CLAS Certificates

Certificate Program	Administered By	Page
Enriched College Degree Certificate	CLAS	324
African American Studies Certificate	African American Studies Program	431
American Public Policy Certificate	Department of Political Science	431
Asian Studies Certificate ¹	Center for Asian Studies	324
Civic Education Certificate	Department of Political Science	432
East Asian Studies Certificate	Center for Asian Studies	324
Ethics Certificate	Department of Philosophy	325
Geographic Information Science, Interdisciplinary Certificate in	CLAS	—
Health Physics Certificate	Pre-Health Professions Office	325
History and Philosophy of Science Certificate	Department of Philosophy	325
International Studies Certificate	Department of Political Science	430
Jewish Studies Certificate	Jewish Studies Committee	326
Latin American Studies Certificate ¹	Latin American Studies Center	326
Medieval and Renaissance Studies Certificate	Arizona Center for Medieval and Renaissance Studies (ACMRS)	326
Medieval Studies Certificate ²	ACMRS	—
Museum Studies Certificate ²	Department of Anthropology	—
Renaissance Studies Certificate ²	ACMRS	—
Russian and East European Studies Certificate ¹	Russian and East European Studies Consortium	326
Scandinavian Studies Certificate	Department of Languages and Literatures	326
Scholarly Publishing Certificate ²	Department of History	—
Southeast Asian Studies Certificate	Program for Southeast Asian Studies	327
Translation Certificate	Department of Languages and Literatures	387
Women's Studies Certificate ²	Women's Studies Program	327
Writing Certificate	Department of English	355

¹ Emphases are also available in these programs.

² For more information, see the *Graduate Catalog*.

Note: Students whose native language is Chinese or Japanese or who have otherwise mastered these languages may elect to take four additional East Asian studies courses in place of the elementary and intermediate language courses.

The center houses a comprehensive library and is involved in student and faculty exchange programs with several Asian universities as well as serving as a liaison with various Asian organizations.

For more information, contact the Center for Asian Studies in WHALL 105, or call 480/965-7184.

Civic Education. See “Certificate in Civic Education,” page 432.

Ethics. This certificate is designed to give students a richer understanding of systematic philosophical thinking about ethics. Students with majors in business, nursing, journalism, and public administration, among others, may well find that training in ethics is beneficial for their career goals. The certificate program permits some flexibility about course selection, thereby facilitating the interests of many students. For more information, visit the Department of Philosophy in PS A524, or call 480/965-3394.

Health Physics. The curriculum of health physics involves work in CLAS and the College of Engineering and Applied Sciences. The purpose of the concentration is to serve undergraduate students who wish to prepare themselves for careers in health physics. To qualify for professional status, a health physicist needs a B.S. degree in one of the physical

or life sciences and a group of specialized courses in physics, mathematics, chemistry, engineering, and biology.

A Certificate of Concentration in Health Physics is awarded for the successful completion of a B.S. degree in a physical or life science that follows a prescribed program. For more information, visit the Pre-Health Professions Office in LSC 206C, or call 480/965-2365, where academic advising is available.

History and Philosophy of Science. The Department of Philosophy offers an undergraduate History and Philosophy of Science Certificate. The certificate program is designed to give students an understanding of both traditional philosophical issues surrounding science and the historical development of concrete scientific theories and ideas. The philosophical questions, of the belief-worthiness and interpretation of scientific claims as well as norms within or about science, both enrich and are enriched by their combination with historical study. Such philosophical and historical study will also often include the examination of contemporary sciences and their place within the larger society.

The certificate requires 18 semester hours bearing a PHI or HPS prefix of which 12 semester hours must be upper-division. Included within the 18 semester hours, at least nine must bear the HPS prefix. PHI 314 Philosophy of Science is also required. All courses counting toward the certificate must be approved for this purpose by a Department of Philosophy undergraduate advisor and passed with a grade of “C” or higher.

For more information, visit the Department of Philosophy in PS A524, or call 480/965-3394.

International Studies. See “Certificate in International Studies,” page 432.

Jewish Studies. The Jewish studies program is designed with the following goals in mind:

1. to examine the history and culture of the Jews;
2. to provide a model for interdisciplinary teaching and research;
3. to generate and facilitate research on Judaica;
4. to provide the community with programs, courses, and research furthering the understanding of Judaica; and
5. to stand as an example of the university’s commitment to a program of meaningful ethnic studies on a firm academic base.

The Certificate of Concentration in Jewish Studies may be combined with a major in any college. For information about the program, refer to the Department of History or the Department of Religious Studies.

Latin American Studies. The Latin American Studies Certificate program is designed to give students an understanding of culture, economics, political structures, and the history of Latin American nations. The Departments of Anthropology, Economics, Geography, History, Languages and Literatures (Spanish and Portuguese), Political Science, and the College of Business offer courses that combine to make up the interdisciplinary certificate. Students must complete 30 semester hours of upper-division courses from the above departments/colleges with a concentration in Latin America—15 semester hours in the major subject and 15 semester hours in other disciplines. The certificate requires Spanish or Portuguese proficiency through the 313 level of conversation and composition. Only language courses above 313 in literature and civilization will count toward a major or interdisciplinary areas of preparation. Spanish and Portuguese courses above 313 in grammar and phonology will not count toward the major requirements.

The Latin American Studies Center offers the area of emphasis for students who do not wish to attain a high level of language proficiency.

For more information, visit the Latin American Studies Center in SS 213, or call 480/965-5127.

Medieval and Renaissance Studies. An undergraduate Certificate in Medieval and Renaissance Studies is offered by the Arizona Center for Medieval and Renaissance Studies (ACMRS). In addition to the course work and examinations required in a student’s major field of interest, the following minimum requirements must be fulfilled to earn the certificate:

1. six to eight semester hours of classical Latin and six to eight semester hours of Latin (classical and/or medieval) or of a vernacular language of the period (e.g., Old English, Old Norse, Old French, Renaissance Italian);
2. six to eight semester hours of course work in medieval and renaissance studies outside the major discipline;

3. three semester hours of thesis on a topic concerning the Middle Ages or Renaissance. The thesis may be used to fulfill the Honors College thesis requirement for students enrolled in the Honors College; and
4. a minimum of a “C” average in all course work leading to the certificate.

Students interested in the certificate program need to complete an application form before being accepted into the program. Applications are available by calling ACMRS at 480/965-5900.

See the *Graduate Catalog* for information about the Certificate in Medieval Studies and the Certificate in Renaissance Studies, and “Arizona Center for Medieval and Renaissance Studies (ACMRS),” page 31, for information about the center.

Museum Studies. See the *Graduate Catalog* or contact the Department of Anthropology for more information.

Russian and East European Studies. Undergraduate students may complete an interdisciplinary certificate program leading to a bachelor’s degree with a major in the chosen field with an emphasis in Russian and East European studies. The requirements for the Russian and East European Studies Certificate comprise (1) three years (22 hours) of Russian or another Eurasian or East European language and (2) 30 upper-division semester hours in Russian/East European area-related course work.

At least three disciplines must be represented in the area-related course work, and at least 12 hours must be outside the Department of Languages and Literatures (i.e., non-RUS and non-FLA courses). Fulfillment of these requirements is certified by the Russian and East European Studies Consortium and is recognized on the transcript by a bachelor’s degree with “Major in [Discipline], Emphasis in Russian and East European Studies.” The purpose of this undergraduate certificate program is to encourage students majoring in a chosen discipline to develop special competency in Russian or East European language and area studies. A major in any department may elect this emphasis.

For further information, contact the program coordinator of the Russian and East European Studies Consortium at 480/965-4188.

Scandinavian Studies. Students admitted to undergraduate degree programs in any field are eligible for the Scandinavian Studies Certificate program. In addition to the course work and examinations required in the student’s major, the student is responsible for fulfilling the following minimum requirements (21 semester hours) before the certificate is issued:

1. six semester hours of Norwegian or Swedish at the 200 level or above;
2. three semester hours in SCA 250 Introduction to Scandinavian Culture;
3. nine semester hours of upper-division course work in Scandinavian Studies outside the student’s major discipline;
4. a minimum of a “C” average in all course work leading to the certificate; and
5. three semester hours in an independent study thesis on a topic concerning Scandinavian Studies. The thesis may be used to fulfill the Barrett Honors Col-

lege thesis requirement for students enrolled in the Barrett Honors College.

Students who test out of the basic language courses would under advisement take other approved courses to fulfill the minimum requirement of 21 semester hours.

For more information, call the Department of Languages and Literatures at 480/965-6281.

Scholarly Publishing. See the *Graduate Catalog* for information on this certificate program.

Southeast Asian Studies. A Certificate in Southeast Asian Studies is available to any undergraduate student. The certificate program offers two options: (1) an area studies specialization emphasizing courses in the social sciences and humanities and requiring one year of Indonesian, Thai, or Vietnamese and (2) a language specialization requiring a two-year sequence in a Southeast Asian language and a proportional number of area studies courses.

Students wishing to study a Southeast Asian language other than those offered on campus may transfer credits earned at the Southeast Asian Studies Summer Institute, a consortium for intensive language and area studies, or at other accredited programs. Qualified students may request placement testing on other national languages of the region, administered in accordance with the national American Council of Teachers in Foreign Languages (ACTFL) guidelines.

The ASU curriculum includes

1. language instruction in Indonesian, Thai, or Vietnamese;
2. ASB/GCU/HST/POS/REL 240 Introduction to Southeast Asia;
3. HST 308 Modern Southeast Asia;
4. electives in the social sciences and humanities on the history, geography, culture, politics, and religion of the region; and
5. a culminating capstone seminar in which the students share multidisciplinary approaches to the region and integrate knowledge of Southeast Asia with their respective disciplinary orientations.

Courses counting toward the Certificate in Southeast Asian Studies fulfill requirements for undergraduate majors and General Studies in the social and behavioral sciences, humanities, literacy, and global and historical awareness areas. A two-year sequence in Southeast Asian language study meets the foreign language requirement for undergraduates in CLAS.

The Program for Southeast Asian Studies is a federally funded National Resource Center for Southeast Asia. For more information, contact the Program for Southeast Asian Studies in LL 9 (basement), 480/965-4232.

Translation. See “Translation Certificate (Spanish/English),” page 387, for information about the Certificate in Translation.

Women’s Studies. Women’s Studies provides students with an intensive interdisciplinary liberal arts education that enables them to write well, think critically, and analyze problems effectively. Students take a variety of courses, including a capstone seminar requiring original research and writing and an internship that helps them prepare for life after college. Original undergraduate research is encouraged, and some courses involve students in studying community problems and formulating policy solutions.

A Certificate of Concentration in Women’s Studies is awarded for the successful completion of WST 100 (or 300) and WST 337 or 378 and an additional 12 semester hours from the list of approved women’s studies courses, only six hours of which may also be applied toward the student’s major.

Inquiries about the program should be addressed to the Women’s Studies Program in ECA 209, 480/965-2358, where the current list of approved courses is available.

GENERAL INFORMATION

Research Centers. To expand educational horizons and to enrich the curriculum, CLAS maintains the following research centers:

Arizona Center for Medieval and Renaissance Studies
 Cancer Research Institute
 Center for Asian Studies
 Center for Meteorite Studies
 Center for Solid-State Science
 Center for the Study of Early Events in Photosynthesis
 Exercise and Sport Research Institute
 Hispanic Research Center
 Institute of Human Origins
 Joan and David Lincoln Center for Applied Ethics
 Latin American Studies Center

CLAS also participates with the College of Education and the College of Engineering and Applied Sciences in maintaining the Center for Research on Education in Science, Mathematics, Engineering, and Technology. See “Research Centers, Institutes, and Laboratories,” page 27, for more information.

Courses. The faculty also offer the following LIA course to familiarize students with available resources and services for research purposes.

For information on LIA courses, see the *Schedule of Classes*, visit the Office for Academic Programs in SS 111, or call 480/965-6506.

LIBERAL ARTS AND SCIENCES (LIA)

LIA 191 First-Year Seminar. (1–3)

not regularly offered

Department of Aerospace Studies

Air Force ROTC

Col. Ronald Scott Jr.
Chair
 (TC 324) 480/965-3181
www.asu.edu/clas/afrotc

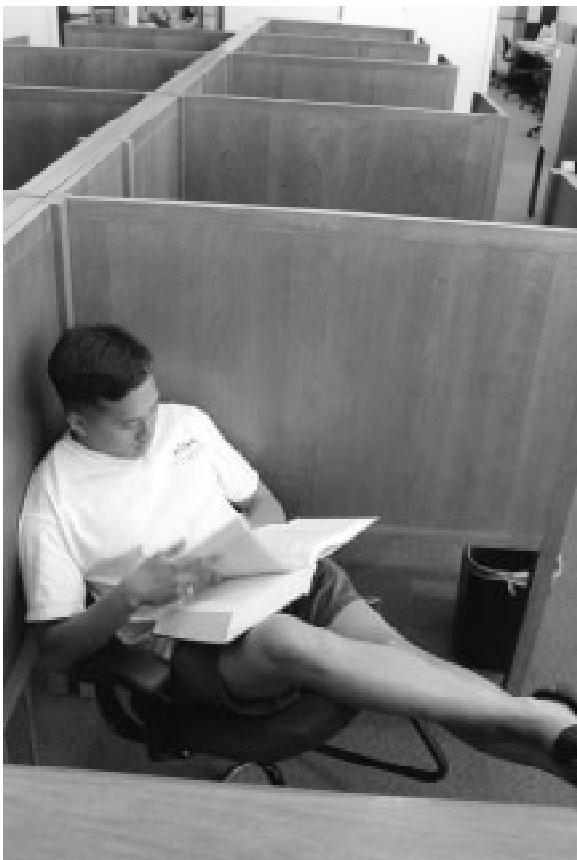
PROFESSOR SCOTT

ASSISTANT PROFESSORS
 BLACKLOCK, EVANCHO, GAGE

PURPOSE

The Department of Aerospace Studies curriculum consists of the general military course and history for freshmen and sophomores (AES 101, 103, 201, 203) and the professional officer course for juniors and seniors (AES 301, 303, 401, 403).

General Qualifications. A man or woman entering the Air Force Reserve Officers' Training Corps (AFROTC) must be the following:



Library carrels provide quiet areas for study.

Tim Trumble photo

1. a citizen of the United States (noncitizens may enroll but must obtain citizenship before commissioning);
2. of sound physical condition; and
3. at least 17 years of age for scholarship appointment or admittance to the Professional Officer Course (POC).

Additionally, scholarship recipients must be able to fulfill commissioning requirements by age 27. If designated for flying training, the student must be able to complete all commissioning requirements before age 29; persons in other categories must be able to complete all commissioning requirements before age 35.

FOUR-YEAR PROGRAM (GMC AND POC)

A formal application is not required for students entering the four-year program. A student may enter the program by simply registering for one of the general military course (GMC) classes at the same time and in the same manner as other courses. GMC students receive two semester hours for each AES 100- and 200-level class completed for a total of eight semester hours. GMC students not on AFROTC scholarship incur no military obligation. Each candidate for commissioning must pass an Air Force aptitude test and a physical examination and be selected by a board of Air Force officers. If selected, the student then enrolls in the POC the last two years of the AFROTC curriculum. Students attend a four-week field training course at an Air Force base normally between the sophomore and junior years. Upon successful completion of the POC and the college requirements for a degree, the student is commissioned in the U.S. Air Force as a second lieutenant. The new officer then enters active duty or may be granted an educational delay to pursue graduate work.

TWO-YEAR PROGRAM (POC)

The basic requirement for entry into the two-year program is that the student have two academic years of college work remaining, either at the undergraduate or graduate level. Applicants seeking enrollment in the two-year program must pass an Air Force aptitude and medical examination and be selected by a board of Air Force officers. After successfully completing a five-week field training course at an Air Force base, the applicant may enroll in the professional officer course (POC) in the AFROTC program. Upon completion of the POC and the college requirements for a degree, the student is commissioned.

Qualifications. The following requirements must be met for admittance to the POC:

1. The four-year student must successfully complete the general military course and the four-week field training course.
2. The two-year applicant must complete a five-week field training course.
3. All students must pass the Air Force Officer Qualifying Test (AFOQT).
4. All students must pass the Air Force physical examination.
5. All students must maintain the minimum GPA required by the college.

6. All students must meet the physical fitness requirements.

Pay and Allowances. POC members in their junior and senior years receive \$200 per month for a maximum of 20 months of POC attendance. Students are also paid to attend field training. In addition, uniforms, housing, and meals are provided during field training at no cost to the student. Students are reimbursed for travel to and from field training.

Scholarships. AFROTC offers scholarships annually to outstanding young men and women on a nationwide competitive basis. Scholarships can cover college tuition for nonresident students and provide an allowance for books, fees, supplies and equipment, and a monthly tax-free allowance of \$200. Scholarships are available on a four-, three-, or two-year basis. To qualify for a four- or three-year scholarship, a student must be a U.S. citizen and submit an application before December 1 of the senior year in high school. Interested students should consult their high school counselors or call AFROTC at ASU for application forms to be submitted to

HQ AFROTC
MAXWELL AFB
AL 36112-6663

Students enrolled in AFROTC at ASU are eligible for a limited number of three- or two-year scholarships. Those students interested must apply through the Department of Aerospace Studies. Consideration is given to academic grades, the score achieved on the AFOQT, and physical fitness. A board of officers considers an applicant's personality, character, and leadership potential.

AEROSPACE STUDIES (AES)

AES 101 Air Force Today I. (2)

fall

Introduction to U.S. Air Force and AFROTC. Topics include: the Air Force mission and organization, customs and courtesies, officer opportunities, officership, and professionalism.

AES 102 Leadership Lab. (0)

fall

Emphasis on common Air Force customs and courtesies, drill and ceremonies, health and physical fitness through group participation. Corequisite: AES 101.

AES 103 Air Force Today II. (2)

spring

Continuation of AES 101. Topics include: the Air Force mission and organization, customs and courtesies, officer opportunities, officership, and professionalism. Prerequisite: AES 101 or department approval.

AES 104 Leadership Lab. (0)

spring

Continuation of AES 102 with more in-depth emphasis on learning the environment of an Air Force officer. Corequisite: AES 103.

AES 201 The Evolution of USAF Air and Space Power I. (2)

fall

Further preparation of the AFROTC candidate. Topics include: Air Force heritage and leaders, communication skills, ethics, leadership, quality Air Force, and values. Prerequisite: AES 103 or department approval.

AES 202 Leadership Lab. (0)

fall

Application of advanced drill and ceremonies, issuing commands, knowing flag etiquette, and developing, directing, and evaluating skills to lead others. Corequisite: AES 201.

AES 203 The Evolution of USAF Air and Space Power II. (2)

spring

Continuation of AES 201. Topics include: the Air Force mission and organization, customs and courtesies, officer opportunities, officership, and professionalism. Prerequisite: AES 201 or department approval.

AES 204 Leadership Lab. (0)

spring

Continuation of AES 202 with emphasis on preparation for field training. Corequisite: AES 203.

AES 301 Air Force Leadership Studies I. (3)

fall

Study of communication skills, leadership and quality management fundamentals, leadership ethics, and professional knowledge required of an Air Force officer. Prerequisite: AES 203 or department approval. *General Studies: L*

AES 302 Leadership Lab. (0)

fall

Advanced leadership experiences applying leadership and management principles to motivate and enhance the performance of other cadets. Corequisite: AES 301.

AES 303 Air Force Leadership Studies II. (3)

spring

Continuation of AES 301. Topics include: communication skills, ethics, leadership, professional knowledge, and quality management required of an Air Force officer. Prerequisite: AES 203 or department approval. *General Studies: L*

AES 304 Leadership Lab. (0)

spring

Continuation of AES 302 with emphasis on planning the military activities of the cadet corps and applying advanced leadership methods. Corequisite: AES 303.

AES 401 National Security Affairs. (3)

fall

Examines advanced ethics, Air Force doctrine, national security process, and regional studies. Special topics include: civilian control of the military, military justice, and officership. Prerequisite: AES 303 or department approval. *General Studies: L*

AES 402 Leadership Lab. (0)

fall

Advanced leadership experience demonstrating learned skills in planning and controlling the military activities of the corps. Corequisite: AES 401.

AES 403 Preparation for Active Duty II. (3)

spring

Continuation of AES 401. Topics include: civilian control of the military, doctrine, ethics, military justice, the national security process, and officership. Prerequisite: AES 401 or department approval.

AES 404 Leadership Lab. (0)

spring

Continuation of AES 402 with emphasis on preparation for transition from civilian to military life. Corequisite: AES 403.

African American Studies Program

Leonor Boulín Johnson
Director
 (COWDN 227) 480/965-4399
www.asu.edu/clas/afamstu

CORE FACULTY

Associate Professors: Boulín Johnson, Eze;
 Clinical Associate Professor: Cox

AFFILIATED FACULTY

Anthropology

Senior Lecturer: Winkelman;
 Visiting Professor: Usman

Art

Professors: Sweeny, Young

Dance

Faculty Associate: Ganyo

Education

Associate Professor: Hood;
 Assistant Professors: Fisher, Matthews

English

Professor: Lester;
 Associate Professors: Chancy, DeLamotte, Miller;
 Assistant Professor: Fuse

Family and Human Development

Associate Professor: Wilson

History

Associate Professor: Hendricks

Human Communication

Professors: Jain, Martin;
 Associate Professor: Davey;
 Assistant Professor: Davis

Humanities

Assistant Professor: Lund

Journalism and Telecommunication

Associate Professor: Bramlett-Solomon

Justice Studies

Professors: Jurik, Romero, Zatz;
 Associate Professor: Figueria-McDonough;
 Assistant Professor: Bernstein

Life Sciences

Associate Professor: Graves (ASU West)

Music

Professor: Sunkett;
 Associate Professors: Smith, Solis

Political Science

Associate Professor: Mitchell

Psychology

Faculty Associate: Cota

Recreation Management and Tourism

Associate Professor: Teye

Religious Studies

Associate Professor: Moore

Sociology

Professor: Cobas;
 Associate Professor: Keith;
 Assistant Professor: Rhea

Theater

Associate Professor: Edwards

Women Studies

Professor: Rothschild

African American Studies (AAS) is interdisciplinary and focuses on people of African descent throughout the world. Focus is given to the diversity of past and present experiences of those who live in the United States as well as in Africa, the Caribbean, South America, and Central America. As an institutional program with a bidisciplinary emphasis, AAS is structured to

1. prepare students of all ethnicities to better understand, value, and more effectively participate in our increasingly diverse society;
2. combine knowledge of the African diaspora with intellectual and practical training in specific areas for the purpose of creating more effective community and global partnerships; and
3. provide students with a foundation for advanced studies in a variety of fields. While the program is dedicated to scholarly research, teaching, and creative activities, it also seeks to build partnerships with community based programs and organizations within Arizona and utilize channels for informing policies which affect the life of Blacks in the diaspora.

AFRICAN AMERICAN STUDIES—B.A.

Course Requirements. The major in African American Studies requires 45 semester hours of course work. A minimum of 30 semester hours must be AFH, AFR, and AFS courses. The remaining course work must be in a related field approved by an AAS advisor. All majors must take 18 hours in the following core courses:

AFH 353 African American Literature: Beginnings Through the Harlem Renaissance <i>L/HU, C</i>	3
or AFH 354 African American Literature: Harlem Renaissance to the Present <i>L/HU, C</i> (3)	
AFR 210 Introduction to African American Studies <i>C</i>	3
AFR 429 African American Studies Theory and Methods	3
AFR 490 Field Studies in the Diaspora	3
or AFR 498 Pro-Seminar (3)	
AFS 363 African American History to 1865 <i>SB, C, H</i>	3
AFS 364 African American History since 1865 <i>SB, C, H</i>	3

Within the 45 semester hours, AAS majors must also take 12 semester hours in one of three concentrations: social and behavioral sciences, humanities/arts, or politics and society. These courses are in addition to the required 18 core course semester hours. Of the remaining course work, 15 hours must be taken in related courses (i.e., non-African American Studies' prefixes). These courses must be selected from the concentrations (at least one from each concentration) in consultation with the major advisor.

In addition, AAS majors are required to take a minor or a certificate program of a minimum of 18 hours in another academic field.

CERTIFICATE IN AFRICAN AMERICAN STUDIES

Course Requirements. The certificate requires 24 semester hours. Fifteen core hours must be taken from the following courses:

- AFH 353 African American Literature: Beginnings Through the Harlem Renaissance *L/HU, C*3
or AFH 354 African American Literature: Harlem Renaissance to the Present *L/HU, C* (3)
AFR 210 Introduction to African American Studies *C*3
AFR 429 African American Studies Theory and Methods3
AFS 363 African American History to 1865 *SB, C, H*3
AFS 364 African American History Since 1865 *SB, C, H*3

In addition, one course from each of the three concentrations (i.e., social and behavioral sciences, humanities/arts, politics and society) must be taken. These courses are in addition to the required core courses. Courses should be selected in consultation with the major advisor.

MINOR IN AFRICAN AMERICAN STUDIES

Course Requirements. The minor requires 18 semester hours. All African American Studies minors must take nine core hours from the following courses:

- AFH 353 African American Literature: Beginnings Through the Harlem Renaissance *L/HU, C*3
or AFH 354 African American Literature: Harlem Renaissance to the Present *L/HU, C* (3)
AFR 210 Introduction to African American Studies *C*3
AFS 363 African American History to 1865 *SB, C, H*3
or AFS 364 African American History Since 1865 *SB, C, H* (3)

In addition, one course from each of the three concentrations (i.e., social and behavioral sciences, humanities/arts, politics and society) must be taken. These courses are in addition to the required core courses. A minimum of 12 semester hours of upper-division courses is required. Courses should be selected in consultation with the major advisor.

AFRICAN AMERICAN STUDIES (AFR)

AFR Note 1. For Justice Studies students to take a nonrequired 300-level JUS course, they must have at least a "C" in each of the required JUS courses—JUS 105 (or 305), 301, 302, and 303—and a minimum average GPA of 2.50 for these four classes. For non-Justice Studies students to take a 300-level JUS course, they must have a minimum of 56 earned semester hours (junior status) and a minimum cumulative GPA of 2.00. Non-Justice Studies students may take JUS 301, 302, and 303 with school approval.

AFR 105 Introduction to Justice Studies. (3)

fall, spring, summer

Introductory overview to the study of justice from a social science perspective. Primary topics include justice theories and justice research. Credit is allowed for only AFR 105 or 305 (or JUS 305). Appropriate for freshmen and sophomores. Lecture, discussion. Cross-listed as JUS 105. Credit is allowed for only AFR 105 or JUS 105.

AFR 191 First Year Seminar. (1–3)

not regularly offered

AFR 194 Special Topics. (1–4)

not regularly offered

AFR 210 Introduction to African American Studies. (3)

fall

Examination of the political, historical, and cultural origins of African American studies as an academic discipline. Lecture, discussion.

General Studies: C

AFR 263 Elements of Intercultural Communication. (3)

fall, spring, summer

Basic concepts, principles, and skills for improving communication between persons from different minority, racial, ethnic, and cultural backgrounds. Lecture, discussion. Cross-listed as COM 263. Credit is allowed for only AFR 263 or COM 263. Prerequisite: 2.25 GPA.

General Studies: SB, C, G

AFR 294 Special Topics. (1–4)

not regularly offered

AFR 298 Honors Directed Study. (1–6)

not regularly offered

AFR 305 Principles of Justice Studies. (3)

fall, spring, summer

Introductory overview to the study of justice from a social science perspective. Primary topics include justice theories and justice research. Credit is allowed for only AFR 305 or 105 (or JUS 105). Appropriate for juniors and seniors. Lecture, discussion. Cross-listed as JUS 305. Credit is allowed for only AFR 305 or JUS 305. See AFR Note 1.

AFR 317 Genes, Race, and Society. (3)

spring

Examines history of biological and social constructions of "race" in western society. Lecture, discussion.

General Studies: SB, C, H

AFR 321 Wealth Distribution and Poverty. (3)

once a year

Examines wealth and income distribution in the United States and analyzes ideological and political forces producing an increasingly unequal society. Lecture, discussion. Cross-listed as JUS 321. Credit is allowed for only AFR 321 or JUS 321. See AFR Note 1.

General Studies: SB, C

AFR 371 Language, Culture, and Communication. (3)

fall and spring

Cultural influences of language on communication, including social functions of language, bilingualism, biculturalism, and bidialectism. Lecture, discussion. Cross-listed as COM 371. Credit is allowed for only AFR 371 or COM 371. Prerequisites: COM 263 (or AFR 263) or instructor approval; minimum cumulative ASU GPA of 2.50.

General Studies: SB, C, G

AFR 394 Special Topics. (1–4)

not regularly offered

AFR 428 Critical Race Theory. (3)

spring

Examination of ways in which race has been historically utilized, constructed, and contested in American civil society. Lecture, discussion.

AFR 429 African American Studies Theory and Methods. (3)

spring

Examines social and behavioral science theories and methodological procedures pertaining to African Americans. Prerequisite: senior standing.

AFR 460 Race, Gender, and Media. (3)

spring

Reading seminar designed to give students a probing examination of the interface between AHANA Americans and the mass media in the United States. Lecture, discussion. Cross-listed as MCO 460. Credit is allowed for only AFR 460 or MCO 460.

General Studies: C

AFR 463 Intercultural Communication Theory and Research. (3)

fall, spring, summer

Survey and analysis of major theories and research dealing with communication between people of different cultural backgrounds, primarily in international settings. Lecture, discussion, small group work. Cross-listed as COM 463. Credit is allowed for only AFR 463 or COM 463.

Prerequisites: both COM 263 (or AFR 263) and 308 or only instructor approval; minimum cumulative ASU GPA of 2.50.

General Studies: SB, G

AFR 484 Internship. (1–12)

not regularly offered

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

AFR 490 Field Studies in the Diaspora. (3)*spring*

Introduction to methods and principles of research applied to Black communities within and outside Arizona. Involves working with field officer and faculty. Lecture, field study. Prerequisite: senior standing. Pre- or corequisite: AFR 429.

AFR 492 Honors Directed Study. (1–6)*not regularly offered***AFR 493 Honors Thesis. (1–6)***not regularly offered**General Studies: L***AFR 494 Special Topics. (1–4)***not regularly offered***AFR 497 Honors Colloquium. (1–6)***not regularly offered***AFR 498 Pro-Seminar. (3)***spring*

Topic is selected by instructor in consultation with the student. Designed to integrate and develop research skills. Required for majors. Prerequisite: senior standing. Pre- or corequisite: AFR 429.

AFR 499 Individualized Instruction. (1–3)*not regularly offered***AFR 584 Internship. (1–12)***not regularly offered***AFR 598 Special Topics. (1–4)***not regularly offered***AFR 684 Internship. (1–12)***not regularly offered***AFR 784 Internship. (1–12)***not regularly offered***AFRICAN AMERICAN STUDIES HUMANITIES (AFH)**

AFH Note 1. Completion of the First-Year Composition requirement (ENG 101 and 102 [or 105] or ENG 107 and 108 with a grade of "C" or higher) is a prerequisite for all English courses above the 100 level.

AFH Note 2. A term paper or equivalent out-of-class written work is required in all upper-division (300- and 400-level) ENG courses.

AFH Note 3. English majors and minors are expected to have completed ENG 200 before taking 400-level literature courses.

AFH 202 Art of Africa, Oceania, and the Americas. (3)*spring*

History of art of Africa, Oceania, and the New World. Meets non-Western art history requirement. Cross-listed as ARS 202. Credit is allowed for only AFH 202 or ARS 202.

*General Studies: HU, G, H***AFH 210 Introduction to Ethnic Studies in the U.S. (3)***fall and spring*

Covers diversity of experiences and relations among racial and ethnic groups in the United States. Lecture, discussion. Cross-listed as APA 210/CCS 210. Credit is allowed for only AFH 210 or APA 210 or CCS 210.

*General Studies: C***AFH 225 African American Religion. (3)***not regularly offered*

Introduction to the history and development of the African American religious tradition. Lecture, discussion. Cross-listed as REL 225. Credit is allowed for only AFH 225 or REL 225.

*General Studies: HU, C***AFH 322 Malcolm and Martin. (3)***not regularly offered*

Examines and contrasts the lives, ministries, contributions, and legacies of Malcolm X and Martin Luther King, Jr. Cross-listed as REL 322. Credit is allowed for only AFH 322 or REL 322.

*General Studies: HU, C***AFH 323 Black Religion: A Biographical Approach. (3)***not regularly offered*

Examines the experiences, motivations, and contributions of a number of figures associated with African American religion. Cross-listed as REL 323. Credit is allowed for only AFH 323 or REL 323.

*General Studies: HU, C***AFH 333 American Ethnic Literature. (3)***once a year*

Examination of America's multiethnic identity through works of literature that depict American ethnic, gender, and class sensibilities. Cross-listed as ENG 333. Credit is allowed for only AFH 333 or ENG 333. See AFH Notes 1, 2.

*General Studies: L, C***AFH 347 Jazz in America. (3)***fall, spring, summer*

Current practices employed by contemporary jazz musicians; the historical development of jazz techniques. Credit not applicable toward any Music degree. Lecture, discussion. Cross-listed as MUS 347. Credit is allowed for only AFH 347 or MUS 347.

*General Studies: HU***AFH 353 African American Literature: Beginnings Through the Harlem Renaissance. (3)***fall*

Thematic and cultural study of African American literature through the Harlem Renaissance. Cross-listed as ENG 353. Credit is allowed for only AFH 353 or ENG 353. See AFH Notes 1, 2.

*General Studies: L/HU, C***AFH 354 African American Literature: Harlem Renaissance to the Present. (3)***spring*

Thematic and cultural study of African American literature from the Harlem Renaissance to the present. Cross-listed as ENG 354. Credit is allowed for only AFH 354 or ENG 354. See AFH Notes 1, 2.

*General Studies: L/HU, C***AFH 401 Focus on Multiethnic Film. (3)***not regularly offered*

Specialized study of major ethnic films and prominent film artists. Emphasis on the creative process. Lecture, film viewing, papers. Prerequisite: ENG 101.

AFH 459 Studies in African American/Caribbean Literatures. (3)*not regularly offered*

Studies in African American or Caribbean literatures according to genre, period, theory, or selected authors. May be repeated for credit when topics vary. Cross-listed as ENG 459. Credit is allowed for only AFH 459 or ENG 459. See AFH Notes 1, 2, 3.

AFRICAN AMERICAN STUDIES SOCIAL SCIENCE (AFS)**AFS 202 Ethnic Relations in the United States. (3)***fall and spring*

Processes of intercultural relations; systems approach to history of U.S. interethnic relations; psychocultural analysis of contemporary U.S. ethnic relations. Lecture, discussion. Cross-listed as ASB 202. Credit is allowed for only AFS 202 or ASB 202.

*General Studies: C, H***AFS 310 African/African American Psychology. (3)***fall and spring*

Historical and contemporary overview of the development of African/Black psychology and African American frame of reference. Lecture, discussion.

AFS 363 African American History to 1865. (3)*once a year*

The African American in American history, thought, and culture from slavery to 1865. Cross-listed as HST 333. Credit is allowed for only AFS 363 or HST 333.

*General Studies: SB, C, H***AFS 364 African American History Since 1865. (3)***once a year*

The African American in American history, thought, and culture from 1865 to the present. Cross-listed as HST 334. Credit is allowed for only AFS 364 or HST 334.

*General Studies: SB, C, H***AFS 366 African Civilization Before 1850. (3)***fall and spring*

African culture history and precolonial civilization. Meets non-Western requirement. Lecture, discussion. Cross-listed as ASB 366. Credit is allowed for only AFS 366 or ASB 366.

General Studies: SB, G, H

AFS 370 Family, Ethnic, and Cultural Diversity. (3)

fall and spring

Integrative approach to understanding historical and current issues related to the structure and internal dynamics of diverse American families. Lecture, discussion. Cross-listed as FAS 370. Credit is allowed for only AFS 370 or FAS 370. Prerequisite: PGS 101 or SOC 101.

General Studies: SB, C

AFS 466 Peoples and Cultures of Africa. (3)

fall and spring

Survey of African peoples and their cultures, external contact, and changes. Meets non-Western requirement. Lecture, discussion. Cross-listed as ASB 466. Credit is allowed for only AFS 466 or ASB 466.

General Studies: SB, G, H

Department of Anthropology

John K. Chance

Chair

(ANTH 233) 480/965-6213

www.asu.edu/clas/anthropology

REGENTS' PROFESSOR

TURNER

PROFESSORS

ALVAREZ, BAHR, BRANDT, CARR, CHANCE, CLARK, COWGILL, EDER, HUDAK, JOHANSON, KINTIGH, KOSS-CHIOINO, MARTIN, MARZKE, MERBS, NASH, B. NELSON, M. NELSON, REDMAN, SPIELMANN, STARK, WILLIAMS

ASSOCIATE PROFESSORS

BARTON, FALCONER, HEGMON, KIMBEL, RICE, WELSH

ASSISTANT PROFESSORS

BAKER, HAENN, JONSSON, LOCKWOOD, REED, STEADMAN

SENIOR LECTURER

WINKELMAN

ASSOCIATE RESEARCH PROFESSORS

SIMON, SUGIYAMA

ASSISTANT RESEARCH PROFESSOR

McCARTNEY

ANTHROPOLOGY—B.A.

Course Requirements. The Anthropology major consists of 45 semester hours, of which 39 must be in anthropology and six in related fields. At least 18 of the semester hours must be in upper-division courses (300–400 level). Three of the six hours in related fields must be in statistics. Related fields are determined by the students in consultation with their advisor. No ASU course is automatically classified as being either related or unrelated. Course requirements for the major are distributed follows:

Required Introductory Courses

ASB 102	Introduction to Cultural and Social Anthropology <i>SB, G</i>	3
ASB 222	Buried Cities and Lost Tribes: Our Human Heritage <i>HU/SB, G, H</i>	3
	or ASB 223 Buried Civilizations of the Americas <i>HU/SB, G, H (3)</i>	
ASM 101	Human Origins and the Development of Culture <i>SB</i>	3

Distribution Requirements

Archaeology.....	6
Geographic area course in archaeology or physical anthropology.....	3
Geographic area course in ethnography.....	3
Linguistics.....	3
Physical anthropology.....	6
Social/cultural.....	6

Elective

Anthropology.....	3
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Related Fields

Statistics.....	3
Approved course.....	3
Total.....	45

Consultation with the undergraduate advisor and a faculty mentor in the Department of Anthropology is recommended each semester. The anthropology undergraduate advising office is located in ANTH 208.

Course work in anthropology completed at other institutions is evaluated by the undergraduate advisor. The College of Liberal Arts and Sciences requires that transfer students complete at least 12 semester hours of upper-division course work at ASU in the department of their major in order to be eligible for graduation.

In addition to a cumulative GPA of 2.00 or higher, all anthropology students must obtain a minimum grade of “C” in all upper- and lower-division anthropology courses and all related fields.

Each student’s Declaration of Graduation and Degree Audit Report, or Program of Study, must be reviewed and approved by the anthropology undergraduate advisor.

INTRODUCTORY, DISTRIBUTION, AND RELATED FIELDS REQUIREMENTS (45 SEMESTER HOURS)

Consult with an anthropology undergraduate advisor for semester course description booklets and semester schedules, which indicate the regular and omnibus courses being offered. No courses may be used to fulfill more than one Anthropology major or minor requirement.

Required Introductory Courses

ASB 102	Introduction to Cultural and Social Anthropology <i>SB, G</i>	3
ASB 222	Buried Cities and Lost Tribes <i>HU/SB, G, H</i>	3
	or ASB 223 Buried Civilizations of the Americas <i>HU/SB, G, H (3)</i>	
ASM 101	Human Origins and the Development of Culture <i>SB</i>	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Distribution Requirements**Linguistics**

One course chosen from the following list*	3
ASB 480 Introduction to Linguistics <i>SB</i> (3)	
ASB 481 Language and Culture <i>SB</i> (3)	
ASB 483 Sociolinguistics and the Ethnography of Communication <i>SB</i> (3)	

Sociocultural

Two courses chosen from the following list* (minimum hours)	6
ASB 202 Ethnic Relations in the United States <i>C, H</i> (3)	
ASB 211 Women in Other Cultures <i>HU/SB, G</i> (3)	
ASB 311 Principles of Social Anthropology <i>SB</i> (3)	
ASB 314 Comparative Religion (3)	
ASB 350 Anthropology and Art (3)	
ASB 351 Psychological Anthropology <i>SB</i> (3)	
ASB 353 Death and Dying in Cross-Cultural Perspective <i>HU/SB, G</i> (4)	
ASB 411 Kinship and Social Organization (3)	
ASB 412 History of Anthropology <i>L/SB</i> (3)	
ASB 416 Economic Anthropology <i>L/SB</i> (3)	
ASB 417 Political Anthropology (3)	

Archaeology

Two courses chosen from the following list* (minimum hours)	6
ASB 231 Archaeological Field Methods <i>SG</i> (4)	
ASB 326 Human Impacts on Ancient Environments <i>SB, H</i> (3)	
ASB 330 Principles of Archaeology <i>SB</i> (3)	
ASB 335 Prehistory of the Southwest <i>SB, C, H</i> (3)	
ASB 337 Pre-Hispanic Civilization of Middle America <i>HU/SB, G, H</i> (3)	
ASB 338 Archaeology of North America <i>SB, H</i> (3)	
ASB 361 Old World Prehistory I <i>H</i> (3)	
ASB 362 Old World Prehistory II <i>H</i> (3)	
ASM 338 Anthropological Field Session (2–8)	
ASM 365 Laboratory Methods in Archaeology (4)	
ASM 435 Archaeological Pollen Analysis (3)	
ASM 472 Archaeological Ceramics (3)	

Physical Anthropology

Two courses chosen from the following list* (minimum hours)	6
ASM 246 Human Origins (3)	
ASM 301 Peopling of the World <i>SB</i> (3)	
ASM 341 Human Osteology (4)	
ASM 342 Human Biological Variation <i>SG</i> (3)	
ASM 343 Primatology (3)	
ASM 344 Fossil Hominids <i>H</i> (3)	
ASM 345 Disease and Human Evolution (3)	
ASM 348 Social Issues in Human Genetics <i>SB</i> (3)	
ASM 452 Dental Anthropology <i>SG</i> (4)	
ASM 454 Comparative Primate Anatomy (4)	
ASM 455 Primate Behavior Laboratory <i>L</i> (3)	

Geographic Area Courses*Archaeology or Physical Anthropology*

One course chosen from the following list*	3
ASB 333 New World Prehistory <i>L/SB</i> (3)	
ASB 335 Prehistory of the Southwest <i>SB, C, H</i> (3)	
ASB 337 Pre-Hispanic Civilization of Middle America <i>HU/SB, G, H</i> (3)	
ASB 338 Archaeology of North America <i>SB, H</i> (3)	
ASB 361 Old World Prehistory I <i>H</i> (3)	
ASB 362 Old World Prehistory II <i>H</i> (3)	
ASM 301 Peopling of the World <i>SB</i> (3)	

Ethnographic

One course chosen from the following list*	3
ASB 319 The North American Indian (3)	
ASB 321 Indians of the Southwest <i>L/SB, C, H</i> (3)	
ASB 322 Indians of Mesoamerica <i>SB, G</i> (3)	
ASB 323 Indians of Latin America <i>SB, G</i> (3)	
ASB 324 Peoples of the Pacific <i>G</i> (3)	
ASB 325 Peoples of Southeast Asia <i>G</i> (3)	
ASB 485 U.S.-Mexico Border in Comparative Perspective (3)	

Related Fields (six semester hours)

One lower- or upper-division statistics course in mathematics, sociology, psychology, political science, or history	3
One course from a field related to but outside of anthropology chosen with advisor	3

Anthropology Elective

Any anthropology course (minimum)	3
Total	45

* Consult with an anthropology undergraduate advisor for courses not listed above that may fulfill distribution requirements.

MINOR IN ANTHROPOLOGY

The Anthropology minor requires 18 semester hours. Two of the introductory courses—from ASB 102, ASM 101, and ASB 222 or 223—are required. The particular introductory courses selected may limit the anthropology courses available in the upper division however. The other 12 semester hours must be upper division and represent at least two of the three subfields of anthropology. The three subfields are:

1. sociocultural anthropology (with linguistics);
2. archaeology; and
3. physical anthropology.

The courses chosen to represent two of the three subfields must be drawn from the “Distribution Requirements” table, page 333, of those two subfields. A minimum grade of “C” is required for all courses taken for the minor in Anthropology.

The minor in Anthropology provides students with a great deal of flexibility in selecting courses. The program has been designed to allow students to focus on areas within the discipline which articulate well with their major. All students interested in the Anthropology minor are encouraged to discuss the options available with an anthropology undergraduate advisor.

CONCENTRATION IN ANTHROPOLOGY FOR B.I.S. MAJORS

For students pursuing the Bachelor of Interdisciplinary Studies (B.I.S.) degree, a concentration in anthropology requires 24 semester hours. All three of the introductory courses—ASB 102, ASM 101, and ASB 222 or 223—are required. The other 15 semester hours must be upper division and represent two of the three subfields:

1. sociocultural anthropology (with linguistics);
2. archaeology; and
3. physical anthropology.

The courses chosen to represent the two subfields must be drawn from the “Distribution Requirements” table, page 333. A minimum grade of “C” is required for all courses taken for the minor in Anthropology for B.I.S. students.

Latin American Studies Certificate or Emphasis. Students majoring in Anthropology may elect to pursue a Latin American Studies Certificate or emphasis, combining courses from the major with selected outside courses of wholly Latin American content. For more information, see “Latin American Studies,” page 326.

Certificate in Museum Studies. See the *Graduate Catalog* or contact the Department of Anthropology for more information.

GRADUATE PROGRAM

The faculty in the Department of Anthropology offer programs leading to the M.A. and Ph.D. degrees. See the *Graduate Catalog* for requirements.

SECONDARY EDUCATION—B.A.E.

Social Studies. The major teaching field consists of 63 semester hours, of which 30 hours must be in the anthropology courses required for the B.A. degree. Of the remaining hours, two groups of 15 hours are to be taken in related social sciences. Psychology or a single natural science may be used as one of the 15-hour fields. SED 480 is taken to provide the remaining three hours.

SED 480 Special Methods of Teaching Social Studies.....	3
Anthropology	30
Social sciences	15
Social sciences, natural sciences, or psychology	15
Total	63

The minor teaching field consists of 24 semester hours in anthropology. Courses ASB 102 and ASM 101 and two upper-division courses in each subfield (archaeology, physical anthropology, and sociocultural anthropology) are required.

ANTHROPOLOGY (ASB)

ASB 102 Introduction to Cultural and Social Anthropology. (3)

fall and spring

Principles of cultural and social anthropology, with illustrative materials from a variety of cultures. The nature of culture. Social, political, and economic systems; religion, aesthetics, and language.

General Studies: SB, G

ASB 202 Ethnic Relations in the United States. (3)

fall and spring

Processes of intercultural relations; systems approach to history of U.S. interethnic relations; psychocultural analysis of contemporary U.S. ethnic relations. Lecture, discussion. Cross-listed as AFS 202. Credit is allowed for only AFS 202 or ASB 202.

General Studies: C, H

ASB 210 Sex, Marriage, and Evolution. (3)

fall

Examination of the sexual nature and behavior of humans from both a biological and an anthropological point of view.

ASB 211 Women in Other Cultures. (3)

not regularly offered

Cross-cultural analysis of the economic, social, political, and religious factors that affect women's status in traditional and modern societies.

General Studies: HU/SB, G

ASB 222 Buried Cities and Lost Tribes: Our Human Heritage. (3)

spring

Archaeology through its most important discoveries: human origins, Pompeii, King Tut, the Holy Land, Southwest Indians, and methods of field archaeology.

General Studies: HU/SB, G, H

ASB 223 Buried Civilizations of the Americas. (3)

fall and spring

Archaeology through examination of several ancient civilizations of Meso-, South, and North America.

General Studies: HU/SB, G, H

ASB 231 Archaeological Field Methods. (4)

spring

Excavation of archaeological sites and recording and interpretation of data. Includes local field experience. 2 hours lecture, 8 hours lab. Prerequisite: ASM 101 or instructor approval.

General Studies: SG

ASB 240 Introduction to Southeast Asia. (3)

fall

Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as GCU 240/HST 240/POS 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.

General Studies: G

ASB 242 Asian American Experiences: An Anthropological Perspective. (3)

fall

Historical and contemporary experiences of Asian Americans in terms of the anthropological concepts of culture, ethnicity, and adaptation.

Prerequisite: ENG 101 (or 105).

General Studies: L, C

ASB 250 Anthropology Topics. (3)

spring

Covers five areas of anthropological inquiry. Emphasizes library research, critical analysis, and communication skills relevant to upper-division anthropology course work. Prerequisites: ASB 102; ASM 101 (or its equivalent); completion of the First-Year Composition requirement.

General Studies: L

ASB 252 Anthropology of Sports. (3)

fall and spring

Cross-cultural examination of symbolic and social dimensions of sports past and present.

ASB 302 Ethnographic Field Study in Mexico. (3)

summer

Fieldwork study of cultural adaptation, Mexican culture, United States-Mexican cultural conflict, ethnographic research methods, and local culture. Lecture, discussion, field research. Pre- or corequisite: SPA 101 (or its equivalent).

General Studies: L/SB, G

ASB 311 Principles of Social Anthropology. (3)

spring

Comparative analysis of domestic groups and economic and political organizations in primitive and peasant societies.

General Studies: SB

ASB 314 Comparative Religion. (3)

fall and spring

Origins, elements, forms, and symbolism of religion; a comparative survey of religious beliefs and ceremonies; the place of religion in the total culture. Prerequisite: ASB 102 or instructor approval.

ASB 319 The North American Indian. (3)

once a year

Archaeology, ethnology, and linguistic relationship of the Indians of North America. Does not include Middle America. Prerequisite: ASB 102 or instructor approval.

ASB 320 Indians of Arizona. (3)

fall

Traditional cultures and the development and nature of contemporary political, economic, and educational conditions among Arizona Indians.

ASB 321 Indians of the Southwest. (3)

spring

Cultures of the contemporary Indians of the southwestern United States and their historic antecedents. Prerequisite: ASB 102 or instructor approval.

General Studies: L/SB, C, H

ASB 322 Indians of Mesoamerica. (3)

spring

Historic tribes and folk cultures. Prerequisite: ASB 102 or instructor approval.

General Studies: SB, G

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ASB 323 Indians of Latin America. (3)*fall*

Indigenous cultures of the Amazon, the Andean region, Central America, and southern Mexico. Lecture, discussion. Prerequisite: ASB 102 or instructor approval.

General Studies: SB, G

ASB 324 Peoples of the Pacific. (3)*not regularly offered*

Peoples and cultures of Oceania focusing particularly on societies of Melanesia, Micronesia, and Polynesia. Prerequisite: ASB 102 or instructor approval.

General Studies: G

ASB 325 Peoples of Southeast Asia. (3)*fall*

Cultural-ecological perspective on the peoples of mainland and insular Southeast Asia. Subsistence modes, social organization, and the impact of modernization. Prerequisite: ASB 102 or instructor approval.

General Studies: G

ASB 326 Human Impacts on Ancient Environments. (3)*spring*

World survey of successful and unsuccessful ancient societies and their impacts on the environment.

General Studies: SB, H

ASB 327 Action Anthropology. (3)*fall*

Explores contemporary issues and problem solving in Cuna, Micronesia, Mayan, and U.S. Latino communities, through applied anthropology and community initiatives.

ASB 330 Principles of Archaeology. (3)*fall and spring*

Methods and theories for reconstructing and explaining the lifeways of prehistoric peoples. Prerequisite: 3 hours in archaeology.

General Studies: SB

ASB 333 New World Prehistory. (3)*fall*

Variety of archaeological patterns encountered in the Western Hemisphere. Covers the period from the appearance of humans in the New World to European contact; covers the area from Alaska to Tierra del Fuego. Prerequisite: completion of the First-Year Composition requirement. Pre- or corequisite: 1 upper-division ASU course.

General Studies: L/SB

ASB 335 Prehistory of the Southwest. (3)*fall and spring*

Anthropological understandings of major cultural processes and events in the prehistory of the American Southwest using evidence from archaeology.

General Studies: SB, C, H

ASB 337 Pre-Hispanic Civilization of Middle America. (3)*spring*

Preconquest cultures and civilizations of Mexico. The Aztecs, Mayas, and their predecessors. Prerequisite: ASM 101 or instructor approval.

General Studies: HU/SB, G, H

ASB 338 Archaeology of North America. (3)*not regularly offered*

Origin, spread, and development of the prehistoric Indians of North America up to the historic tribes. Does not include the Southwest. Prerequisite: ASM 101 or instructor approval.

General Studies: SB, H

ASB 350 Anthropology and Art. (3)*once a year*

Art forms of people in relationship to their social and cultural setting. Prerequisite: ASB 102 or instructor approval.

ASB 351 Psychological Anthropology. (3)*spring*

Approaches to the interrelations between the personality system and the sociocultural environment. Prerequisite: ASB 102 or instructor approval.

General Studies: SB

ASB 353 Death and Dying in Cross-Cultural Perspective. (4)*fall*

Humanistic and scientific study of aging, sickness, dying, death, funerals, and grief and their philosophy and ecology in non-Western and Western cultures. 3 hours lecture, 1 hour discussion.

General Studies: HU/SB, G

ASB 355 Shamanism, Healing, and Consciousness. (3)*spring*

World views, practices, and roles of shamans and traditional and contemporary healers; explanatory biopsychological models of consciousness.

General Studies: HU/SB

ASB 361 Old World Prehistory I. (3)*fall*

Biosocial evolution in the Pleistocene, emphasizing technological achievements and the relationship between technology and environment in western Europe, sub-Saharan Africa. Prerequisite: ASM 101 or instructor approval.

General Studies: H

ASB 362 Old World Prehistory II. (3)*spring*

Transition from hunting and collecting societies to domestication economies; establishment of settled village life, emphasizing the Near East, Egypt, Southwest Europe. Prerequisite: ASM 101 or instructor approval.

General Studies: H

ASB 366 African Civilization Before 1850. (3)*fall and spring*

African culture history and precolonial civilization. Meets non-Western requirement. Lecture, discussion. Cross-listed as AFS 366. Credit is allowed for only AFS 366 or ASB 366.

General Studies: SB, G, H

ASB 400 Cultural Factors in International Business. (3)*spring*

Anthropological perspectives on international business relations; applied principles of cross-cultural communication and management; regional approaches to culture and business.

General Studies: G

ASB 411 Kinship and Social Organization. (3)*spring*

Meanings and uses of concepts referring to kinship, consanguinity, affinity, descent, alliance, and residence in the context of a survey of the varieties of social groups, marriage, rules, and kinship terminological systems. Prerequisite: 6 hours in anthropology or instructor approval.

ASB 412 History of Anthropology. (3)*fall*

Historical treatment of the development of the culture concept and its expression in the chief theoretical trends in anthropology between 1860 and 1950. Prerequisite: ASB 102 or instructor approval.

General Studies: L/SB

ASB 416 Economic Anthropology. (3)*fall*

Economic behavior and the economy in preindustrial societies; description and classification of exchange systems; relations between production, exchange systems, and other societal subsystems. Prerequisite: ASB 102 or instructor approval.

General Studies: L/SB

ASB 417 Political Anthropology. (3)*once a year*

Comparative examination of the forms and processes of political organization and activity in primitive, peasant, and complex societies. Prerequisite: ASB 102 or instructor approval.

ASB 462 Medical Anthropology: Culture and Health. (3)*fall*

Role of culture in health, illness, and curing; health status, provider relations, and indigenous healing practices in United States ethnic groups. Lecture, discussion.

General Studies: C

ASB 466 Peoples and Cultures of Africa. (3)*fall and spring*

Survey of African peoples and their cultures, external contact, and changes. Meets non-Western requirement. Lecture, discussion. Cross-listed as AFS 466. Credit is allowed for only AFS 466 or ASB 466.

General Studies: SB, G, H

ASB 471 Introduction to Museums. (3)*fall*

History, philosophy, and current status of museums. Exploration of collecting, preservation, exhibition, education, and research activities in different types of museums. Prerequisites: both ASB 102 and ASM 101 or only instructor approval.

*General Studies: L***ASB 480 Introduction to Linguistics. (3)***fall*

Descriptive and historical linguistics. Survey of theories of human language, emphasizing synchronic linguistics.

*General Studies: SB***ASB 481 Language and Culture. (3)***spring*

Application of linguistic theories and findings to nonlinguistic aspects of culture; language change; psycholinguistics. Prerequisite: ASB 102 or instructor approval.

*General Studies: SB***ASB 483 Sociolinguistics and the Ethnography of Communication. (3)***not regularly offered*

Relationships between linguistic and social categories; functional analysis of language use, maintenance, and diversity; interaction between verbal and nonverbal communication. Prerequisites: both ASB 480 and ENG 213 (or FLA 400) or only instructor approval.

*General Studies: SB***ASB 485 U.S.-Mexico Border in Comparative Perspective. (3)***spring in odd years*

Explores the multicultural and social dimensions of communities along the U.S.-Mexico border, emphasizing social organization, migration, culture, and frontier ideology. Prerequisite: 6 hours in anthropology or instructor approval.

ASB 501 Applied Medical Anthropology. (3)*fall*

Overview of anthropology's applications in medicine and its adaptations to U.S. ethnic populations. Requires research project in medical setting. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 502 Health of Ethnic Minorities. (3)*spring*

Prevalence of illness, risk factors, health ecology, and medical and indigenous treatments. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 503 Advanced Medical Anthropology. (3)*fall*

Theory in medical anthropology and cross-cultural studies that illustrate particular theories. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 504 Ethnic Relations. (3)*fall*

Structural processes of intergroup relations, methods for investigating psychocultural dimensions of ethnicity with focus upon U.S. ethnic groups. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 505 Culture and Psychiatry. (3)*fall*

Psychiatry as a cultural phenomenon and indigenous definitions and treatments of mental disorders across cultures. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 506 Gender, Emotions, and Culture. (3)*spring*

Relationships among gender and emotion across cultures. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 529 Culture and Political Economy. (3)*not regularly offered*

Origin and spread of Western capitalism and its impact on non-Western societies. Utilizes ethnographic and historical case studies. Prerequisite: graduate standing.

ASB 530 Ecological Anthropology. (3)*once a year*

Relations among the population dynamics, social organization, culture, and environment of human populations, with special emphasis on hunter-gatherers and extensive agriculturalists.

ASB 532 Graduate Field Anthropology. (2-8)*spring*

Independent research on a specific anthropological problem to be selected by the student in consultation with the staff. May be repeated for credit. Prerequisites: ASM 338 (or its equivalent); instructor approval.

ASB 536 Ethnohistory of Mesoamerica. (3)*not regularly offered*

Indigenous societies of southern Mexico and Guatemala at Spanish contact and their postconquest transformation. Emphasis on the Aztec Empire. Prerequisite: graduate standing.

ASB 537 Topics in Mesoamerican Archaeology. (3)*not regularly offered*

Changing organization of pre-Columbian civilizations in Mesoamerica is explored through interpretive issues, such as regional analysis, chiefdoms, urbanism, and exchange. Prerequisite: instructor approval.

ASB 540 Method and Theory of Sociocultural Anthropology and Archaeology. (3)*fall*

Basic issues concerning concepts of social and ethnic groups, cultural and sociological theory, and the nature of anthropological research. Prerequisite: instructor approval.

ASB 541 Method and Theory of Social and Cultural Anthropology. (3)*spring*

Continuation of ASB 540. Prerequisite: ASB 540 or instructor approval.

ASB 542 Method and Theory of Archaeology I. (3)*spring*

Models of human evolution, culture change, and interpretation of hunter-gatherer and tribal societies, ceramic, lithic, and faunal materials. Prerequisite: instructor approval.

ASB 543 Method and Theory of Archaeology II. (3)*fall*

Covers concepts of social complexity along with economy, demography, and social dynamics, followed by archaeological research design. Prerequisite: instructor approval.

ASB 544 Settlement Patterns. (3)*not regularly offered*

Spatial arrangement of residences, activity sites, and communities over landscape. Emphasis on natural and cultural factors influencing settlement patterns. Prerequisite: instructor approval.

ASB 546 Pleistocene Prehistory. (3)*fall*

Development of society and culture in the Old World during the Pleistocene epoch, emphasizing technological change through time and the relationship of people to their environment. Prerequisite: ASB 361 (or its equivalent).

ASB 547 Issues in Old World Domestication Economies. (3)*spring*

Archaeological evidence for transitions in Old World subsistence economies from hunting and gathering to dependence on domesticated plants and animals. Prerequisite: ASB 362 (or its equivalent).

ASB 550 Economic Archaeology. (3)*not regularly offered*

Prehistoric economies in hunter-gatherer, tribal, and complex societies. Covers subsistence strategies, craft production and specialization, and exchange. Prerequisite: instructor approval.

ASB 551 Prehistoric Diet. (3)*not regularly offered*

Critical review of techniques for recovering dietary information and theoretical models concerned with explaining diet and nutrition. Prerequisite: instructor approval.

ASB 555 Complex Societies. (3)*spring*

Examines structural variations in hierarchically organized societies, along with origins, dynamics, and collapse. Seminar.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ASB 559 Archaeology and the Ideational Realm. (3)*not regularly offered*

"Postprocessual" and other views concerning relevance of mental phenomena for understanding sociocultural change. Various approaches to inferring prehistoric meanings.

ASB 563 Hunter-Gatherer Adaptations. (3)*not regularly offered*

Evolution of prehistoric hunter-gatherer societies in the Old and New Worlds from the most ancient times through protohistoric chiefdoms. Prerequisite: instructor approval.

ASB 567 Southwestern Archaeology. (3)*spring*

Broad coverage of Southwestern cultural developments focusing on current debates and rigorous use of archaeological data in making cultural inferences.

ASB 568 Intrasite Research Strategies. (3)*fall*

Research issues within a single site context. Topics include quantitative spatial analysis, site definition, sampling, distributional analysis, and substantive interpretation.

ASB 571 Museum Principles. (3)*fall*

History, philosophy, and current status of museums. Exploration of collecting, preservation, exhibition, education, and research activities in different types of museums. Prerequisites: both ASB 102 and ASM 101 or only instructor approval.

ASB 572 Museum Collection Management. (3)*spring*

Principles and practices of acquisition, documentation, care, and use of museum collections; registration, cataloging, and preservation methods; legal and ethical issues. Prerequisite: ASB 571 or instructor approval.

ASB 573 Museum Administration. (3)*spring*

Formal organization and management of museums, governance, personnel matters, fund raising and grantsmanship, legal and ethical issues. Prerequisite: ASB 571 or instructor approval.

ASB 574 Exhibition Planning and Design. (3)*spring*

Exhibition philosophies and development; processes of planning, designing, staging, installing, evaluating, and disassembling temporary and long-term exhibits. Prerequisites: both ASB 571 and 572 or only instructor approval.

ASB 575 Computers and Museums. (3)*fall*

Basics of museum computer application; hardware and software; fundamentals of database management; issues of research, collections management, and administration.

ASB 576 Museum Interpretation. (3)*fall*

Processes of planning, implementing, documenting, and evaluating educational programs in museums for varied audiences—children, adults, and special interest groups. Lecture, discussion. Prerequisite: ASB 571.

ASB 577 Principles of Conservation. (3)*spring*

Preservation of museum objects: nature of materials, environmental controls, and causes of degradation; recognizing problems, damage, and solutions; proper care of objects. Prerequisites: both ASB 571 and 572 or only instructor approval.

ASB 579 Critical Issues in Museum Studies. (3)*fall*

Current debates of museum practice from an anthropological perspective. Addresses issues of collection, presentation, authenticity, and authority. Seminar. Prerequisite: ASB 571 or instructor approval.

ASB 591 Seminar. (1–12)*not regularly offered*

Selected topics in archaeology, linguistics, and social-cultural anthropology. Possible topics:

- (a) Archaeological Ceramics. (3)
- (b) Archaeology of North America. (3)
- (c) Cultural Anthropology. (3)
- (d) Culture and Personality. (3)
- (e) Evolution and Culture. (3)
- (f) Historical Archaeology. (3)
- (g) Interdepartmental Seminar. (3)
- (h) Language and Culture. (3)
- (i) Linguistics. (3)
- (j) Museum Studies. (3)
- (k) Problems in Southwestern Archaeology. (3)
- (l) Problems in Southwestern Ethnology. (3)
- (m) Social Anthropology. (3)

ANTHROPOLOGY (ASM)**ASM 101 Bones, Stones, and Human Evolution. (3)***fall and spring*

Physical anthropology and archaeology. Evidence and processes of human evolution and of culture change. Primates. Fossil hominids and their tools. Race, variation, and heredity. Environment and human biology. Prehistoric culture and society. Corequisite: ASM 103.

*General Studies: SB***ASM 103 Human Origins and the Development of Culture—Laboratory. (1)***fall, spring, summer*

Hands-on laboratory exercises addressing human biological variation, evolutionary mechanisms, nonhuman and human primate morphology and behavior, and the fossil record. Lab exercises, small-group discussion. Corequisite: ASM 101.

ASM 241 Biology of Race. (3)*fall and spring*

Human variation and its interpretation in an evolutionary context.

ASM 246 Human Origins. (3)*fall*

History of discoveries and changing interpretations of human evolution. Earliest ancestors to emergence of modern humans. Humanity's place in nature.

ASM 248 Bioarchaeology of Cannibalism, Violence, and Social Pathology. (3)*spring*

Worldwide review of claims of severely abnormal behavior in prehistory based on perimortem bone taphonomy, analogues, and comparative cases. Lecture, class demonstrations.

ASM 301 Peopling of the World. (3)*spring*

Reviews all evidence for human dispersal during the last 100,000 years, origins of language, cultures, races, and beginnings of modern humans. Prerequisite: ASM 101.

*General Studies: SB***ASM 338 Anthropological Field Session. (2–8)***spring*

Anthropological field techniques, analysis of data, and preparation of field reports. May be repeated for credit. Prerequisite: instructor approval.

ASM 341 Human Osteology. (4)*fall*

Osteology, human paleontology, and osteometry. Description and analysis of archaeological and contemporary human populations. 3 hours lecture, 3 hours lab. Prerequisite: ASM 101 or instructor approval.

ASM 342 Human Biological Variation. (4)*spring*

Evolutionary interpretations of biological variation in living human populations, with emphasis on anthropological genetics and adaptation. Nutrition and disease and their relation to genetics and behavior. 3 hours lecture, 3 hours lab. Prerequisites: both ASM 101 and MAT 106 (or its equivalent) or only instructor approval.

General Studies: SG

ASM 343 Primatology. (3)*fall*

Evolution and adaptations of nonhuman primates, emphasizing social behavior. Includes material from fossil evidence and field and laboratory studies in behavior and biology. Prerequisite: ASM 101 or instructor approval.

ASM 344 Fossil Hominids. (3)*once a year*

Ancient African, Asian, and European human and primate skeletal, dental, and cultural remains. Human biological, behavioral, and cultural evolution. Prerequisite: ASM 101 or instructor approval.

*General Studies: H***ASM 345 Disease and Human Evolution. (3)***fall*

Interaction of people and pathogens from prehistoric times to the present, with emphasis on disease as an agent of genetic selection. Prerequisite: ASM 101 or instructor approval.

ASM 348 Social Issues in Human Genetics. (3)*spring*

Moral and social implications of developments in genetic science, particularly as they affect reproduction, medicine, and evolution.

*General Studies: SB***ASM 365 Laboratory Methods in Archaeology. (4)***not regularly offered*

Techniques of artifact analysis. Basic archaeological research techniques; methods of report writing. May be repeated for credit for total of 8 hours. Prerequisite: ASM 101 or instructor approval.

ASM 435 Archaeological Pollen Analysis. (3)*fall*

Theory, methodology, and practice of pollen analytic techniques. Compares uses in botany, geology, and archaeology. 2 hours lecture, 3 hours lab, possible field trips. Prerequisite: instructor approval.

ASM 448 Geoarchaeology. (3)*fall and spring*

Geologic context relevant to archaeological research. Topics include sediments, deposition environments, soils, anthropogenic and biogenic deposits, and quaternary chronology. Lecture, discussion, field experiences. Prerequisites: ASB 222 (or 223) or GLG 101 (or 103) or GPH 111; instructor approval.

ASM 450 Bioarchaeology. (3)*spring*

Surveys archaeological and physical anthropological methods and theories for evaluating skeletal and burial remains to reconstruct bio-cultural adaptation and lifeways. Prerequisite: ASM 101 or instructor approval.

ASM 452 Dental Anthropology. (4)*fall*

Human and primate dental morphology, growth, evolution, and genetics. Within- and between-group variation. Dental pathology and behavioral-cultural-dietary factors. 3 hours lecture, 3 hours lab. Prerequisite: instructor approval.

*General Studies: SG***ASM 454 Comparative Primate Anatomy. (4)***spring*

Functional anatomy of the cranial, dental, and locomotor apparatus of primates, including humans, emphasizing the relation of morphology to behavior and environment. 3 hours lecture, 3 hours lab, dissections, demonstrations. Prerequisite: instructor approval.

ASM 455 Primate Behavior Laboratory. (3)*not regularly offered*

Instruction and practice in methods of observation and analysis of primate behavior. Discussion of the relationship between class work on captive animals and field techniques for studying free-ranging groups. Directed readings, 6 hours lab. Prerequisites: ASM 343; instructor approval.

*General Studies: L***ASM 456 Infectious Disease and Human Evolution. (3)***once a year*

Study of infectious disease and humanity, using evidence from anthropology, history, medicine, and ancient skeletons. Prerequisite: ASM 345.

ASM 465 Quantification and Analysis for Anthropologists. (3)*spring*

Statistical, quantitative, and geometric strategies for envisioning and exploring archaeological, physical anthropological, bioarchaeological, and sociocultural data. Univariate and multivariate methods. Prerequisites: introductory statistical course; instructor approval.

ASM 472 Archaeological Ceramics. (3)*not regularly offered*

Analysis and identification of pottery wares, types, and varieties. Systems for ceramic classification and cultural interpretation. 2 hours lecture, 3 hours lab. Prerequisite: instructor approval.

ASM 507 Anthropological Study of Disease. (3)*once a year*

In-depth introduction to the study of disease processes from an anthropological perspective. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASM 548 Geoarchaeology. (3)*fall*

Geologic context relevant to archaeological research. Topics include sediments, deposition environments, soils, anthropogenic and biogenic deposits, and quaternary chronology. Prerequisite: instructor approval.

ASM 555 Advanced Human Osteology. (3)*not regularly offered*

Laboratory and field techniques in dealing with the human skeleton. Emphasis on preparation, identification, radiography, sectioning, microscopy, and data processing. 1 hour lecture, 6 hours lab. Prerequisite: ASM 341 or instructor approval.

ASM 565 Quantitative Archaeology. (3)*spring*

Formal methods of structuring, codifying, and analyzing data for archaeological problems. Designing research to yield data amenable to productive analysis.

ASM 566 Advanced Topics in Quantitative Archaeology. (3)*fall*

Archaeological issues associated with quantitative analysis, e.g., Bayesian and Monte Carlo approaches, simulation, diversity. May be repeated for credit. Prerequisite: ASM 565 or instructor approval.

ASM 573 Lithic Analysis. (3)*not regularly offered*

Analysis and interpretation of chipped stone artifacts. Focus on both techniques and underlying concepts and their application to real collections. Prerequisite: instructor approval.

ASM 591 Seminar. (1–12)*not regularly offered*

Selected topics in archaeology and physical anthropology. Possible topics:

- (a) Bioarchaeology. (3)
- (b) Evolution and Culture. (3)
- (c) Interdepartmental Seminar. (3)
- (d) Physical Anthropology. (3)
- (e) Primates and Behavior. (3)

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Department of Biology

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ALCOCK

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LYUBCHENKO

CURATOR OF COLLECTIONS

DOUGLAS

BIOLOGY—B.S.

The major in Biology consists of a minimum of 43 semester hours in biology, and a minimum of 17 semester hours in related fields, plus a three-semester-hour mathematics proficiency. Required major courses are as follows:

BIO 193 The Nature of Biological Science <i>SQ</i>	4
or BIO 181 General Biology <i>SQ</i> (4)	
and BIO 182 General Biology <i>SG</i> (4)	
BIO 320 Fundamentals of Ecology	3
BIO 340 General Genetics	4
or BIO 341 Genetic Analysis (5)	
BIO 345 Organic Evolution	3
BIO 353 Cell Biology	3
BIO 360 Animal Physiology	4
or MIC 360 Bacterial Physiology (3)	
or PLB 308 Plant Physiology (4)	
BIO 370 Vertebrate Zoology	4
or BIO 385 Comparative Invertebrate Zoology (4)	
or MIC 206 Microbiology Laboratory <i>SG*</i> (1)	
and MIC 220 Biology of Microorganisms (3)	
or PLB 300 Comparative Plant Diversity <i>L/SG</i> (4)	
Total	25 or 26

* Both MIC 205 and 206 must be taken to secure *SG* credit.
MIC 205 may not be substituted for MIC 220.

The remaining hours to bring the total to 43 are selected from among upper-division courses, approved for major credit, in BIO, MIC, PLB, and approved BCH courses, in consultation with a Department of Biology advisor. The major must include at least three upper-division laboratory courses, and at least one upper-division course in plant biology (PLB) or microbiology (MIC). Required courses in related fields plus math proficiency are as follows:

CHM 113 General Chemistry <i>SQ</i>	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i>	5
Choose between the combinations of organic chemistry	
courses below	4 or 8
CHM 231 Elementary Organic Chemistry <i>SQ</i> ¹ (3)	
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> ¹ (1)	
_____ or _____	
CHM 331 General Organic Chemistry (3)	
CHM 332 General Organic Chemistry (3)	
CHM 335 General Organic Chemistry Laboratory (1)	
CHM 336 General Organic Chemistry Laboratory (1)	
MAT 210 Brief Calculus <i>MA</i>	3
or any calculus	
Choose between the combinations of introduction	
to physics courses below	4
PHY 101 Introduction to Physics <i>SQ</i> (4)	
_____ or _____	
PHY 111 General Physics <i>SQ</i> ² (3)	
PHY 112 General Physics <i>SQ</i> ² (3)	
PHY 113 General Physics Laboratory <i>SQ</i> ² (1)	
PHY 114 General Physics Laboratory <i>SQ</i> ² (1)	
Total	20 or 24

¹ Both CHM 231 and 235 must be taken to secure *SQ* credit.

² Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure *SQ* credit.

CONSERVATION BIOLOGY—B.S.

The major in Conservation Biology consists of a minimum of 45 semester hours in the required major courses and a minimum of 13 hours in related fields, plus a three-semester-hour mathematics proficiency. Required courses are as follows:

BIO 193 The Nature of Biological Science <i>SQ</i>	4
or BIO 181 General Biology <i>SQ</i> (4)	
and BIO 182 General Biology <i>SG</i> (4)	
BIO 317 Conservation Biology	3
BIO 320 Fundamentals of Ecology	3
BIO 340 General Genetics	4
or BIO 341 Genetic Analysis (5)	
BIO 360 Animal Physiology	4
BIO 410 Techniques in Wildlife Conservation Biology <i>L</i>	3
BIO 411 Advanced Conservation Biology I	3
BIO 412 Advanced Conservation Biology II	3
BIO 415 Biometry <i>CS</i>	4
Total	31 or 32

The remaining hours to bring the total to 45 will be selected from among relevant upper-division courses in BIO and PLB courses or in related departments, in consultation with a Department of Biology advisor. Required courses in related fields plus math proficiency are as follows:

CHM 113 General Chemistry <i>SQ</i>	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i>	5

Choose between the combinations of organic chemistry courses below	4 or 8
CHM 231 Elementary Organic Chemistry <i>SQ</i> * (3)	
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> * (1)	
or	
CHM 331 General Organic Chemistry (3)	
CHM 332 General Organic Chemistry (3)	
CHM 335 General Organic Chemistry Laboratory (1)	
CHM 336 General Organic Chemistry Laboratory (1)	
MAT 210 Brief Calculus <i>MA</i>	3
or any calculus	
Total	16 or 20

* Both CHM 231 and 235 must be taken to secure *SQ* credit.

Concentration in Biology and Society

The major in Biology with a concentration in biology and society is intended for students with a strong interest in life sciences and in the interaction between life sciences and the society within which science is done. This option consists of a minimum of 44 semester hours in life sciences and societal interface courses, and 12 hours in related fields, plus a three-semester-hour mathematics proficiency. Required courses are as follows:

BIO 193 The Nature of Biological Science <i>SQ</i>	4
or BIO 181 General Biology <i>SQ</i> (4)	
and BIO 182 General Biology <i>SG</i> (4)	
BIO 311 Biology and Society	3
BIO 320 Fundamentals of Ecology	3
or BIO 345 Organic Evolution (3)	
BIO 340 General Genetics.....	4
or BIO 341 Genetic Analysis (5)	
BIO 419 Research Colloquium in Biology and Society <i>L</i>	3
BIO 484 Internship	3
or BIO 493 Honors Thesis <i>LHU</i> (3)	
or BIO 495 Undergraduate Thesis (3)	
or BIO 499 Individualized Instruction (3)	
or approved hours in research (3)	
MAT 210 Brief Calculus <i>MA</i>	3
or any calculus	
Total	23—24

The remaining courses to complete the major are determined by the student in consultation with a Department of Biology advisor and must be distributed in the following areas:

- 12 hours of upper-division electives from BIO, MIC, PLB;
- 12 hours of upper-division interface courses from an approved list. At least three semester hours in each of these areas: ethics, history and philosophy of science, and contemporary societal issues;
- 11 hours of physical sciences (CHM recommended); and
- three to four hours of an approved course in statistics.

MINOR IN BIOLOGY

The Biology minor consists of 24 semester hours, including BIO 193 The Nature of Biological Science or BIO 181

General Biology and BIO 182 General Biology, and 16 to 20 hours selected with approval of an advisor in the Department of Biology; at least 12 hours must be in the upper division. Courses not available for credit in the Life Sciences major (BIO, MBB, MIC, and PLB) cannot be used for the minor (e.g., BIO 100 The Living World and BIO 201 Human Anatomy and Physiology I). This minor is not available to students majoring in the life sciences.

SECONDARY EDUCATION—B.A.E.

Biological Sciences. The major teaching field consists of a minimum of 40 semester hours and at least 22 hours in supporting courses. Required major courses are as follows:

BIO 193 The Nature of Biological Science <i>SQ</i>	4
or BIO 181 General Biology <i>SQ</i> (4)	
and BIO 182 General Biology <i>SG</i> (4)	
BIO 320 Fundamentals of Ecology	3
BIO 340 General Genetics.....	4
or BIO 341 Genetic Analysis (5)	
BIO 345 Organic Evolution	3
BIO 360 Animal Physiology.....	4
BIO 370 Vertebrate Zoology.....	4
or BIO 385 Comparative Invertebrate Zoology (4)	
or PLB 300 Comparative Plant Diversity <i>L/SG</i> (4)	
or PLB 310 The Flora of Arizona (4)	
MIC 206 Microbiology Laboratory <i>SG</i> *	1
MIC 220 Biology of Microorganisms	3
PLB 308 Plant Physiology	4
Total	30 or 31

* Both MIC 205 and 206 must be taken to secure *SG* credit.

The remaining courses in the major (six hours minimum) should be selected to reflect a balance between BIO and PLB courses. Required supporting courses are as follows:

BIO 316 History of Biology: Conflicts and Controversies <i>H</i>	3
or HPS 330 History of Biology: Conflicts and Controversies <i>H</i> (3)	
CHM 113 General Chemistry <i>SQ</i>	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i>	5
GLG 102 Introduction to Geology II (Historical) <i>SG</i> , ¹ <i>H</i>	3
or GLG 300 Geology of Arizona (3)	
MAT 170 Precalculus <i>MA</i>	3
PHY 101 Introduction to Physics <i>SQ</i>	4
or PHY 111, 112 General Physics <i>SQ</i> ² (6)	
and PHY 113, 114 General Physics Laboratory <i>SQ</i> ² (2)	
Minimum total	22

¹ Both GLG 102 and 104 must be taken to secure *SG* credit.

² Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure *SQ* credit.

BIO 480 Methods of Teaching Biology and BIO 482 Advanced Methods of Teaching Biology are required in the professional education program.

The minor teaching field consists of 24 semester hours as follows: BIO 181, 182; 16 additional hours in BIO, MIC, and PLB courses selected to reflect a balance across the disciplines and subdisciplines in biology. BIO 480 is

required in addition to the 24 semester hours in biological sciences.

GRADUATE PROGRAM

The faculty in the Department of Biology offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. (with a concentration in ecology for the M.S. and the Ph.D.). See the *Graduate Catalog* for requirements.

The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. See the *Graduate Catalog* for more information.

BIOLOGY (BIO)

BIO 100 The Living World. (4)

fall, spring, summer

Principles of biology. Cannot be used for major credit in the biological sciences. 3 hours lecture, 3 hours lab.

General Studies: SQ

BIO 120 Human Physiology. (4)

not regularly offered

Basic concepts of general science are discussed using current issues and basic concepts of human physiology as a focus. Cannot be used for major credit in biological sciences. 3 hours lecture, 3 hours lab.

General Studies: SG

BIO 181 General Biology. (4)

fall, spring, summer

Biological concepts emphasizing fundamental principles and the interplay of structure and function at the molecular, cellular, organismal, and population levels of organization. Secondary school chemistry strongly recommended. 3 hours lecture, 3 hours lab. Prerequisite: biological sciences major or preprofessional student in health-related sciences.

General Studies: SQ

BIO 182 General Biology. (4)

fall, spring, summer

Continuation of BIO 181. Secondary school chemistry strongly recommended. Fee. Prerequisite: BIO 181.

General Studies: SG

BIO 193 The Nature of Biological Science. (4)

not regularly offered

Creative and critical thinking skills in biological research; nature of biological knowledge; role of experimentation, predictions, hypotheses, theories, values. Lecture, lab, discussion. Fee. Prerequisite: high school biology.

General Studies: SQ

BIO 201 Human Anatomy and Physiology I. (4)

fall, spring, summer

Structure and dynamics of the human mechanism. Cannot be used for major credit in the Department of Biology. 3 hours lecture, 3 hours lab.

General Studies: SG

BIO 202 Human Anatomy and Physiology II. (4)

fall, spring, summer

Continuation of BIO 201. Cannot be used for major credit in the Department of Biology. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 201 or instructor approval.

BIO 218 Medical History. (1)

not regularly offered

Brief survey of humankind's important inventions and discoveries in the art and science of medicine, illustrating interrelationships of medical ideas.

BIO 241 Human Genetics. (4)

fall

Introduction to basic concepts in genetics as they are applied to human heredity. Cannot be used for major credit in the Department of Biology. 3 hours lecture, 3 hours lab. Prerequisite: a course in the life sciences.

General Studies: SG

BIO 300 Natural History of Arizona. (3)

not regularly offered

Plant and animal communities of Arizona. Cannot be used for major credit in the biological sciences. Prerequisite: junior standing.

BIO 301 Field Natural History. (1)

not regularly offered

Organisms and their natural environment. 2 weekend field trips, field project. Cannot be used for major credit in the biological sciences. Fee. Pre- or corequisite: BIO 300.

BIO 302 Cancer and Heart Disease. (3)

fall

Incidence and mortality statistics for cancer and heart disease; host and environmental risk factors; diagnosis, treatment and prevention strategies. Cannot be counted toward a Biology major. Prerequisites: a combination of CHM 231 (or its equivalent) and 12 hours in life sciences and a General Studies L course or only instructor approval.

General Studies: L

BIO 303 Radiation and Life. (3)

spring

Benefits and risks of radiation exposure in society; medical applications, food irradiation, nuclear power, solar UV, population health effects. Cannot be counted toward a Biology major. Prerequisites: a combination of CHM 231 (or its equivalent) and 12 hours in life sciences and a General Studies L course or only instructor approval.

General Studies: L

BIO 304 Radiation Medicine and Biology. (3)

fall

Uses of radiation in medicine, including CT, diagnostic X-ray, MRI, nuclear medicine, ultrasound; biological effects of radiation with emphasis on cancer. Prerequisites: a combination of PHY 112 and 12 hours in life sciences and a General Studies L course or only instructor approval.

General Studies: L

BIO 310 Special Problems and Techniques. (1-3)

fall and spring

Qualified undergraduates may investigate a specific biological problem under the direction of a faculty member. May be repeated for a total of 6 semester hours. Prerequisites: formal conference with the instructor; approval of the problem by the instructor and department chair.

BIO 311 Biology and Society. (3)

spring

Explores interactions between biological sciences and society, e.g., biomedical, environmental, ethical, historical, legal, philosophical, political, and social issues. Lecture, discussion. Prerequisites: both BIO 181 and 182 or only BIO 193 (or 100).

BIO 316 History of Biology: Conflicts and Controversies. (3)

not regularly offered

Focuses on 19th and 20th centuries, considering biology as a discipline. Evolution, problems of heredity, development, and cell theory. Cross-listed as HPS 330. Credit is allowed for only BIO 316 or HPS 330.

General Studies: H

BIO 317 Conservation Biology. (3)

fall

Scientific and technical means for management, maintenance, protection, and restoration of biological resources on this planet. Prerequisite: 8 hours in biology.

BIO 318 History of Medicine. (3)

once a year

Scientific study of the human body, changing theories of disease, evolution of practical opinions on treatment, and the emerging institutionalization of medical practice. Cross-listed as HPS 331. Credit is allowed for only BIO 318 or HPS 331.

General Studies: H

BIO 319 Environmental Science (Nonmajor). (3)

fall

Environmental and biological concepts used to understand ecological systems with specific references to problems caused by humans. Cannot be used for major credit in the biological sciences. Cross-listed as PLB 320. Credit is allowed for only BIO 319 or PLB 320.

General Studies: G

BIO 320 Fundamentals of Ecology. (3)

fall and spring

Organization, functioning, and development of ecological systems; energy flow; biogeochemical cycling; environmental relations; population dynamics. Prerequisite: BIO 182 or instructor approval.

BIO 321 Introductory Ecology Laboratory. (3)*once a year*

Laboratory and field observations and experiments to test current concepts and theories in ecology. Lab. Fee. Pre- or corequisite: BIO 320.
General Studies: L

BIO 331 Animal Behavior. (3)*fall*

Evolutionary, genetic, physiological, and ecological bases of animal behavior. Prerequisite: BIO 182 (or its equivalent).

BIO 336 Sociobiology. (3)*not regularly offered*

Survey of animal and human social behavior examined from an evolutionary perspective. Suitable for nonmajors. BIO 331 is recommended.

BIO 340 General Genetics. (4)*fall, spring, summer*

Science of heredity and variation. 3 hours lecture, 1 hour recitation. Prerequisite: BIO 182.

BIO 341 Genetic Analysis. (5)*not regularly offered*

General genetics: science of heredity and variation using critical inquiry. Not open to students with credit for BIO 340. 3 hours lecture, 6 hours lab. Prerequisites: BIO 182 and 193 (or their equivalents).

BIO 342 General Genetics Laboratory. (2)*fall*

General principles of inheritance with special reference to Mendelian, molecular, and computational genetics are explored via laboratory experiments. Lab. Pre- or corequisite: BIO 340.

BIO 343 Genetic Engineering and Society. (4)*fall*

Introduction to genetic engineering, with emphasis on applications (gene therapy, DNA fingerprinting, bioremediation, transgenic animals and plants). 3 hours lecture, 3 hours lab. Cross-listed as MBB 343. Credit is allowed for only BIO 343 or MBB 343. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).

*General Studies: L***BIO 344 Origins, Evolution, and Creation. (3)***not regularly offered*

Examines scientific, mythic, and religious ideas relating to origins (particularly human). Place of antievolutionism and "scientific creationism" in American culture. Lecture, discussion. Cross-listed as HPS 311/HUM 371/REL 383. Credit is allowed for only BIO 344 or HPS 311 or HUM 371 or REL 383.

BIO 345 Organic Evolution. (3)*spring*

Processes of adaptive change and speciation in sexual populations. Prerequisite: BIO 182.

BIO 346 The Darwinian Revolution. (3)*not regularly offered*

Intellectual and cultural history of Darwinism and modern evolutionary theory and their impact on 19th- and 20th-century thought. Lecture, discussion. Cross-listed as HPS 332/HUM 372. Credit is allowed for only BIO 346 or HPS 332 or HUM 372.

BIO 351 Developmental Anatomy. (3)*fall*

General developmental biology (embryology) and comparative structure of organ systems, illustrated mainly by vertebrate examples. Prerequisite: BIO 182.

BIO 352 Laboratory in Vertebrate Developmental Anatomy. (2)*fall*

Morphology of representative embryonic and adult vertebrates. BIO 351 recommended. 2 3-hour labs. Fee. Prerequisite: BIO 182.

BIO 353 Cell Biology. (3)*fall, spring, summer*

Survey of major topics in cell biology, including structural, biochemical, and molecular aspects of cell function. Prerequisite: BIO 182.

BIO 360 Animal Physiology. (4)*fall and spring*

Physiological mechanisms of the higher vertebrates. 3 hours lecture, 3 hours lab. Fee. Prerequisites: BIO 182; CHM 115; MAT 117.

BIO 370 Vertebrate Zoology. (4)*fall and spring*

Characteristics, classification, evolution, and natural history of the major groups of vertebrate animals. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 182.

BIO 385 Comparative Invertebrate Zoology. (4)*fall*

Characteristics, life cycles, adaptations, and evolution of invertebrate animals. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 182 or instructor approval.

BIO 386 General Entomology. (4)*not regularly offered*

Form, activities, and classification of insects. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 182.

BIO 394 Special Topics. (2-3)*not regularly offered*

Topics of current or special interest in one or more aspects of biology. Topics vary. Prerequisite: junior standing.

BIO 406 Computer Applications in Biology. (3)*fall*

Computer analysis techniques in biology emphasizing data entry, management and analysis, and graphic portrayal. Employs mainframe and microcomputers. 2 hours lecture, 3 hours lab. Cross-listed as PLB 432. Credit is allowed for only BIO 406 or PLB 432. Prerequisites: both BIO 182 and MAT 117 (or 210) or only instructor approval.

*General Studies: CS***BIO 410 Techniques in Wildlife Conservation Biology. (3)***fall*

Field and analytical techniques used in evaluating population structure, viability and environmental impacts. Lecture, lab. Fee. Prerequisites: both BIO 317 and 320 or only instructor approval.

*General Studies: L***BIO 411 Advanced Conservation Biology I. (3)***fall*

Principles of conservation science, biology of threatened species, management principles that meet conservation goals, emphasizing North American ecosystems. Prerequisites: BIO 317, 320.

BIO 412 Advanced Conservation Biology II. (3)*spring*

Global biodiversity patterns, processes, and conservation; global environmental change; sustainable use of natural resources; emphasizing international approaches to conservation biology. Prerequisites: BIO 317, 320.

BIO 415 Biometry. (4)*fall*

Statistical methods applied to biological problems, design of experiments, estimation, significance, analysis of variance, regression, correlation, chi square, and bioassay; the use of computers. Does not satisfy laboratory requirements for the College of Liberal Arts and Sciences' General Studies program. 3 hours lecture, 3 hours lab. Prerequisite: MAT 210 (or its equivalent).

*General Studies: CS***BIO 416 Professional Values in Science. (3)***once a year*

Considers issues related to values in science such as collaboration, finances, legal issues, media, mentoring, ownership of ideas, scientific integrity. Discussion, student projects. Cross-listed as HPS 410. Credit is allowed for only BIO 416 or HPS 410.

*General Studies: L***BIO 419 Research Colloquium in Biology and Society. (3-6)***fall and spring*

Develops critical thinking abilities, research methods, and writing skills for research in the interactions between biological sciences and society. Discussion. Prerequisite: BIO 311 or instructor approval.

*General Studies: L***BIO 420 Field Zoology. (3)***not regularly offered*

Experience in zoological field techniques. Requires weekend or longer field trips. Prerequisite: instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

BIO 423 Population and Community Ecology. (3)*not regularly offered*

Organization and dynamics of population and communities, emphasizing animals. Theoretical and empirical approaches. Prerequisite: BIO 320 or instructor approval.

BIO 424 Mathematical Models in Ecology. (4)*not regularly offered*

Mathematical modeling of populations, communities, and ecosystems, including case studies and student-designed projects. 3 hours lecture, 3 hours lab. Prerequisites: BIO 320; any calculus course.

BIO 425 Animal Ecology. (3)*not regularly offered*

Physiological and behavioral adaptations of individual animals to both abiotic and biotic environments. Prerequisite: BIO 320.

BIO 426 Limnology. (4)*not regularly offered*

Structure and function of aquatic ecosystems, with emphasis on freshwater lakes and streams. 3 hours lecture, 3 hours lab or field trip. Fee. Prerequisite: BIO 320 or instructor approval.

*General Studies: L***BIO 427 Fire. (3)***spring in odd years*

Interdisciplinary survey of fire on Earth—its history, ecology, and management. Prerequisite: BIO 182.

BIO 428 Biogeography. (3)*fall*

Environmental and historical processes determining distributional patterns of animals and plants, emphasizing terrestrial life. Prerequisites: BIO 182 (or its equivalent); junior standing.

*General Studies: L***BIO 431 Human Development and Fertility. (3)***not regularly offered*

Global influences of human population development on the human environment, including understanding human fertility and clinical influences on fertility. Discussion, presentation. Prerequisite: general biology.

BIO 435 Research Techniques in Animal Behavior. (3)*not regularly offered*

Experimental and field studies of animal behavior; description and quantification of animal behavior and interpretation of behavior within an evolutionary framework. 1 hour lecture, 6 hours lab. Prerequisite: BIO 331.

*General Studies: L***BIO 441 Cytogenetics. (3)***not regularly offered*

Chromosomal basis of inheritance. Cross-listed as PLB 412. Credit is allowed for only BIO 441 or PLB 412. Prerequisite: BIO 340.

BIO 442 Cytogenetics Laboratory. (2)*not regularly offered*

Microscopic analysis of meiosis, mitosis, and aberrant cell division. 6 hours lab. Cross-listed as PLB 413. Credit is allowed for only BIO 442 or PLB 413. Pre- or corequisite: BIO 441 or PLB 412.

BIO 446 Principles of Human Genetics. (3)*once a year*

Molecular and cellular analysis of the human genome. Prerequisite: BIO 340.

*General Studies: L***BIO 450 Advanced Developmental Biology. (3)***spring*

Current concepts and experimental methods involving differentiation and biosynthetic activities of cells and organisms, with examples from microorganisms, plants, and animals. Prerequisite: BIO 351.

BIO 453 Animal Histology. (4)*spring*

Microscopic study of animal tissues. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 182 or instructor approval.

BIO 454 Aquatic Insects. (3)*not regularly offered*

Systematics and ecology of aquatic insects. Prerequisite: BIO 386.

BIO 464 Photobiology. (3)*not regularly offered*

Principles underlying the effects of light on growth, development, and behavior of plants, animals, and microorganisms. Cross-listed as PLB 440. Credit is allowed for only BIO 464 or PLB 440. Prerequisites: CHM 231 (or 331); 12 hours in life sciences.

BIO 465 Neurophysiology. (3)*spring in even years*

Detailed treatment of cellular and organismal neurophysiology and nervous system function. Prerequisite: BIO 360.

BIO 466 Neurophysiology Laboratory. (2)*not regularly offered*

Intracellular and extracellular electrophysiological recording techniques, histological preparations, and dye-filling techniques. 6 hours lab. Pre- or corequisite: BIO 465.

BIO 470 Systematic Zoology. (4)*spring in odd years*

Philosophy, theory, practice of interpreting animal diversity, including species concepts speciation, nomenclature, and evolutionary and phylogenetic classification emphasizing phylogenetics. 3 hours lecture, 3 hours lab. Prerequisites: junior standing; 18 hours in life sciences.

*General Studies: L***BIO 471 Ornithology. (3)***spring in odd years*

Biology of birds. 2 hours lecture, 3 hours lab, weekend field trips. Fee. Prerequisite: BIO 370 or instructor approval.

BIO 472 Mammalogy. (4)*fall in odd years*

Classification, structure, habits, ecology, and distribution of mammals, emphasizing North American forms. 3 hours lecture, 3 hours lab or field trip, weekend field trips. Fee. Prerequisite: BIO 370 or instructor approval.

BIO 473 Ichthyology. (3)*spring in odd years*

Systematics and biology of recent and extinct fishes. 2 hours lecture, 3 hours lab or field trip, weekend field trips required. Fee. Prerequisites: both BIO 370 and 425 or only instructor approval.

BIO 474 Herpetology. (3)*spring in even years*

Systematics and biology of recent and extinct reptiles and amphibians. 2 hours lecture, 3 hours lab or field trip. Fee. Prerequisite: BIO 370.

BIO 480 Methods of Teaching Biology. (3)*spring*

Methods of instruction, experimentation, organization, and presentation of appropriate content in biology. Prerequisite: 20 hours in the biological sciences.

BIO 482 Advanced Methods of Teaching Biology. (3)*fall in odd years*

Design, delivery, and evaluation of student-centered, inquiry-based lessons for high school biology students. Learning cycle. Prerequisite: BIO 480.

BIO 484 Internship. (3)*not regularly offered***BIO 493 Honors Thesis. (1–6)***fall, spring, summer**General Studies: L***BIO 494 Special Topics. (1–4)***not regularly offered*

Possible topics:

(a) Cell Biotechnology. (4)

BIO 495 Undergraduate Thesis. (3)*fall, spring, summer*

Guided research culminating in the preparation of an undergraduate thesis based on supervised research done in this and previous semesters. Prerequisites: at least 3 hours of BIO 310 (or 499); formal conference with instructor; instructor and department chair approval.

BIO 499 Individualized Instruction. (1–3)*fall and spring***BIO 502 Transmission Electron Microscopy. (3)***not regularly offered*

Theory, use, and methods of preparing biological materials for transmission electron microscopy. Lecture, lab. Materials fee. Prerequisite: instructor approval.

BIO 505 Scanning Electron Microscopy. (3)*not regularly offered*

Theory, use, and methods of preparing biological materials for scanning electron microscopy. 2 hours lecture, 3 hours lab. Materials fee. Prerequisite: instructor approval.

BIO 508 Scientific Data Presentation. (2)*spring*

Techniques necessary for presentation of scientific data used in journal publications, grant proposals, and visual presentations. Lecture, lab. Prerequisite: instructor approval.

BIO 520 Biology of the Desert. (2)*not regularly offered*

Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisite: 10 hours in biological sciences or instructor approval.

BIO 522 Populations: Evolutionary Ecology. (3)*not regularly offered*

Principles of population biology and community ecology within an evolutionary framework. 2 hours lecture, 2 hours recitation. Prerequisites: BIO 320, 415 (or MAT 210), 545.

BIO 524 Ecosystems. (3)*not regularly offered*

Structure and function of terrestrial and aquatic ecosystems, with emphasis on productivity, energetics, biogeochemical cycling, and systems integration. Prerequisite: BIO 320 (or its equivalent).

BIO 526 Quantitative Ecology. (3)*not regularly offered*

Sampling strategies, spatial pattern analysis, species diversity, classification, and applications of multivariate techniques to ecology. 2 hours lecture, 3 hours lab. Prerequisites: BIO 415 (or its equivalent); a course in ecology.

BIO 529 Advanced Limnology. (3)*not regularly offered*

Recent literature, developments, methods, and limnological theory; field and lab application to some particular topic in limnology. Prerequisite: BIO 426.

BIO 543 Molecular Genetics. (3)*fall*

Nature and function of the gene; emphasis on the molecular basis of inheritance and gene expression in prokaryotes and eukaryotes. Prerequisites: BIO 340; a course in organic chemistry.

BIO 545 Populations: Evolutionary Genetics. (3)*not regularly offered*

Mathematical models in the description and analysis of the genetics of populations. Prerequisites: a combination of BIO 320 and 345 and 415 or only instructor approval.

BIO 547 Techniques in Evolutionary Genetics. (4)*not regularly offered*

Practical experience in modern techniques for the study of evolution. Lecture, lab. Prerequisites: BIO 340, 345; instructor approval.

BIO 550 Advanced Cell Biology. (3)*spring*

Applications of contemporary electron microscopic and biochemical/molecular techniques for studying eukaryotic cell functions. Mechanisms of intracellular protein trafficking. Prerequisites: BIO 353 (or 360 or its equivalent or PLB 360); CHM 231 (or 331 or its equivalent).

BIO 551 Biomembranes. (3)*not regularly offered*

Structure and function of biological membranes, emphasizing synthesis, fluidity, exocytosis, endocytosis, and cell responses to hormones and neurotransmitters. Prerequisites: BIO 353 (or its equivalent); CHM 231 (or 331 or its equivalent).

BIO 552 Developmental Genetics. (3)*spring*

Genetic approaches to the analysis of development during the life cycle of eukaryotic organisms, and the role of genes in the unfolding of the differentiated phenotype. Prerequisite: BIO 340.

BIO 560 Comparative Physiology. (3)*not regularly offered*

Analysis of function in invertebrates and vertebrates, emphasizing evolutionary trends in physiological systems. Prerequisite: BIO 360 (or its equivalent).

BIO 566 Environmental Physiology. (3)*not regularly offered*

Physiological responses and adaptations of animals to various aspects of the physical environment. Prerequisites: BIO 320, 360.

BIO 568 Mammalian Physiology. (3)*not regularly offered*

Detailed treatment of mammalian organ system functions emphasizing integrative mechanisms. Prerequisite: BIO 360 (or its equivalent).

BIO 569 Cellular Physiology. (3)*not regularly offered*

Emphasizes the molecular basis for cell structure and function. Prerequisites: BIO 360; a course in organic chemistry.

BIO 583 OTS: Fieldwork in Tropical Biology. (6–8)*spring and summer*

Intensive field-orientated classes with Organization for Tropical Studies (OTS) in Costa Rica with emphasis on research in ecology and systematics. Lecture, lab, fieldwork. Cross-listed as PLB 583. Credit is allowed for only BIO 583 or PLB 583. Prerequisites: graduate standing; a course in basic ecology.

BIO 584 Internship. (1–12)*fall and spring***BIO 591 Seminar. (1–12)***fall and spring*

May be repeated for credit. Possible topics:

- Adaptations. (1–3)
- Behavior. (1–3)
- Cell Biology. (1–3)
- Ecology. (1–3)
- Evolution. (1–3)
- Genetic Engineering. (1–3)
- Genetics. (1–3)
- Physiology. (1–3)

Department of Chemistry and Biochemistry

J. Devens Gust
Chair

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REGENTS' PROFESSORS

ANGELL, BUSECK, MAYER, C. MOORE,
O'KEEFE, PETTIT

PROFESSORS

ALLEN, BIEBER, BIRK, BLANKENSHIP, FUCHS,
GLAUNSINGER, GLICK, GUST, HOLLOWAY, LOHR,
A. MOORE, T. MOORE, MUNK, PETUSKEY, ROSE, SKIBO,
STEIMLE, WILLIAMS, WOODBURY

ASSOCIATE PROFESSORS

KOUVETAKIS, WOLF

ASSISTANT PROFESSORS

BOOKSH, CAUDLE, FRANCISCO, GOULD, HAYES,
MATYUSHOV, RICHERT

SENIOR LECTURERS

BEDGOOD, WHITE

LECTURER

BAUER

CHEMISTRY—B.A.

The B.A. degree in Chemistry consists of 46 semester hours. Required courses are as follows:

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Choose between the course combinations below..... 9 or 8

CHM 113 General Chemistry *SQ* (4)
 CHM 115 General Chemistry with Qualitative
 Analysis *SQ* (5)

———— or ————

CHM 117 General Chemistry for Majors I *SQ** (4)
 CHM 118 General Chemistry for Majors II *SQ** (4)

Choose between the course combinations below.....8

CHM 317 Organic Chemistry for Majors I* (3)
 CHM 318 Organic Chemistry for Majors II* (3)
 CHM 319 Organic Chemistry Laboratory for Majors I* (1)
 CHM 320 Organic Chemistry Laboratory for Majors II* (1)

———— or ————

CHM 331 General Organic Chemistry (3)
 CHM 332 General Organic Chemistry (3)
 CHM 335 General Organic Chemistry Laboratory (1)
 CHM 336 General Organic Chemistry Laboratory (1)

CHM 325 Analytical Chemistry3
 CHM 326 Analytical Chemistry Laboratory1
 CHM 341 Elementary Physical Chemistry3
 CHM 343 Physical Chemistry Laboratory1
 CHM 453 Inorganic Chemistry3
 CHM electives2

Minimum total30

* CHM 117, 118, 317, 318, 319, and 320 are strongly recommended for qualified students.

Related courses must include the following:

MAT 270 Calculus with Analytic Geometry I *MA*¹4
 MAT 271 Calculus with Analytic Geometry II *MA*¹4
 PHY 111 General Physics *SQ*^{2,3}3
 PHY 112 General Physics *SQ*^{2,3}3
 PHY 113 General Physics Laboratory *SQ*^{2,3}1
 PHY 114 General Physics Laboratory *SQ*^{2,3}1
 Total16

¹ Equivalent courses may be taken in place of MAT 270 and 271.

² More advanced PHY courses may be taken in place of PHY 111, 112, 113, and 114.

³ Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure *SQ* credit.

The remaining courses to complete the major are determined by students in consultation with their advisors.

CHEMISTRY—B.S.

The program consists of 45 semester hours in chemistry and 20 hours of related courses outside the major. Required courses are as follows:

Choose between the course combinations below..... 9 or 8

CHM 113 General Chemistry *SQ* (4)
 CHM 115 General Chemistry with Qualitative
 Analysis *SQ* (5)

———— or ————

CHM 113 General Chemistry *SQ* (4)
 CHM 116 General Chemistry *SQ* (4)

———— or ————

CHM 117 General Chemistry for Majors I *SQ** (4)
 CHM 118 General Chemistry for Majors II *SQ** (4)

Choose between the course combinations below.....8

CHM 317 Organic Chemistry for Majors I* (3)
 CHM 318 Organic Chemistry for Majors II* (3)
 CHM 319 Organic Chemistry Laboratory for Majors I* (1)
 CHM 320 Organic Chemistry Laboratory for Majors II* (1)

———— or ————

CHM 331 General Organic Chemistry (3)
 CHM 332 General Organic Chemistry (3)
 CHM 335 General Organic Chemistry Laboratory (1)
 CHM 336 General Organic Chemistry Laboratory (1)

Total 16 or 17

* CHM 117, 118, 317, 318, 319, and 320 are strongly recommended for qualified students.

Additional required chemistry courses are as follows:

CHM 240 Introduction to Physical Chemistry¹3
 CHM 325 Analytical Chemistry3
 CHM 326 Analytical Chemistry Laboratory1
 CHM 327 Instrumental Analysis3
 CHM 328 Instrumental Analysis Laboratory2
 CHM 345 Physical Chemistry I²3
 CHM 346 Physical Chemistry II²3
 CHM 348 Physical Chemistry Laboratory I *L*²1
 CHM 349 Physical Chemistry Laboratory II *L*²1
 CHM 452 Inorganic Chemistry Laboratory *L*²1
 CHM 453 Inorganic Chemistry3
 CHM 460 Biological Chemistry3
 Chemistry elective (choose from the courses below)2
 CHM 392 Introduction to Research Techniques (1–3)
 CHM 424 Separation Science (3)
 CHM 431 Qualitative Organic Analysis (3)
 CHM 471 Solid-State Chemistry (3)
 CHM 480 Methods of Teaching Chemistry (3)
 CHM 481 Geochemistry (3)
 CHM 485 Meteorites and Cosmochemistry (3)

Total29

¹ Completion of MAT 274 and 342 satisfies the CHM 240 requirement.

² CHM 348, 349, and 452 must all be taken to secure L credit.

Additional required related field courses are as follows:

MAT 270 Calculus with Analytic Geometry I *MA*4
 MAT 271 Calculus with Analytic Geometry II *MA*4
 MAT 272 Calculus with Analytic Geometry III *MA*4
 PHY 121 University Physics I: Mechanics *SQ*¹3
 PHY 122 University Physics Laboratory I *SQ*¹1
 PHY 131 University Physics II: Electricity and
 Magnetism *SQ*²3
 PHY 132 University Physics Laboratory II *SQ*²1
 Total20

¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.

² Both PHY 131 and 132 must be taken to secure *SQ* credit.

A course in a computer language, such as CSE 181 Applied Problem Solving with Visual BASIC or CSE 183 Applied Problem Solving with FORTRAN is strongly recommended.

Transfer students are interviewed and advised of possible preparatory work. They must contact the department to arrange for the interview in advance of registration. See "College Degree Requirements," page 319.

American Chemical Society Certification. A student who satisfactorily completes the B.S. in Chemistry program is certified by the Department of Chemistry and Biochemistry to the American Chemical Society (ACS) as having met the specific requirements for undergraduate professional train-

ing in chemistry. Graduates meeting ACS guidelines can receive a certificate to indicate this fact.

BIOCHEMISTRY—B.S.

The program consists of 36 semester hours in chemistry and 27 semester hours of related courses. Required courses are as follows:

Choose between the course combinations below.....	9 or 8
CHM 113 General Chemistry <i>SQ</i> (4)	
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i> (5)	
_____ or _____	
CHM 113 General Chemistry <i>SQ</i> (4)	
CHM 116 General Chemistry <i>SQ</i> (4)	
_____ or _____	
CHM 117 General Chemistry for Majors I <i>SQ</i> * (4)	
CHM 118 General Chemistry for Majors II <i>SQ</i> * (4)	
Choose between the combinations of courses below.....	8
CHM 317 Organic Chemistry for Majors I* (3)	
CHM 318 Organic Chemistry for Majors II* (3)	
CHM 319 Organic Chemistry Laboratory for Majors I* (1)	
CHM 320 Organic Chemistry Laboratory for Majors II* (1)	
_____ or _____	
CHM 331 General Organic Chemistry (3)	
CHM 332 General Organic Chemistry (3)	
CHM 335 General Organic Chemistry Laboratory (1)	
CHM 336 General Organic Chemistry Laboratory (1)	
Total	16 or 17

* CHM 117, 118, 317, 318, 319, and 320 are strongly recommended for qualified students.

Additional required chemistry courses are as follows:

BCH 461 General Biochemistry	3
BCH 462 General Biochemistry	3
BCH 463 Biophysical Chemistry.....	3
BCH 464 Biophysical Chemistry Laboratory	2
BCH 467 Analytical Biochemistry Laboratory <i>L</i>	3
CHM 341 Elementary Physical Chemistry*	3
Chemistry elective (choose from the courses below)	3
BCH 494 ST: Topics in Nucleic Acids Biochemistry (2)	
BCH 494 ST: Topics in Protein Biochemistry (2)	
CHM 327 Instrumental Analysis (3)	
CHM 424 Separation Science (3)	
CHM 431 Qualitative Organic Analysis (3)	
CHM 453 Inorganic Chemistry (3)	
CHM 471 Solid-State Chemistry (3)	
Total	20

* CHM 345 may be taken in place of CHM 341.

Additional required related field courses are as follows:

BIO 193 The Nature of Biological Science <i>SQ</i>	4
BIO 340 General Genetics.....	4
BIO 353 Cell Biology	3
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹	3
PHY 122 University Physics Laboratory I <i>SQ</i> ¹	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ²	3

PHY 132 University Physics Laboratory II <i>SQ</i> ²	1
Total	27

¹ Both PHY 121 and 122 must be taken to secure *SQ* credit.

² Both PHY 131 and 132 must be taken to secure *SQ* credit.

Additional biology courses selected from BIO 343, 351, 360, 441, 450, and 465 are strongly recommended. Other biology courses may be substituted.

Additional biochemistry and chemistry courses, including CHM 392 Introduction to Research Techniques, may be taken by students and should be chosen in consultation with an advisor.

MINOR IN CHEMISTRY

A minor in Chemistry is awarded to students who complete the following required courses:

CHM 113 General Chemistry <i>SQ</i> ¹	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i> ¹	5
or CHM 116 General Chemistry <i>SQ</i> ¹ (4)	
CHM 325 Analytical Chemistry	3
CHM 326 Analytical Chemistry Laboratory	1
Choose between the course combinations below.....	8
BCH 361 Principles of Biochemistry (3)	
BCH 367 Elementary Biochemistry Laboratory (1)	
CHM 231 Elementary Organic Chemistry <i>SQ</i> ² (3)	
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> ² (1)	
_____ or _____	
CHM 331 General Organic Chemistry (3)	
CHM 332 General Organic Chemistry (3)	
CHM 335 General Organic Chemistry Laboratory (1)	
CHM 336 General Organic Chemistry Laboratory (1)	
Choose between the course combinations below.....	4 or 8
CHM 341 Elementary Physical Chemistry (3)	
CHM 343 Physical Chemistry Laboratory (1)	
_____ or _____	
CHM 345 Physical Chemistry I (3)	
CHM 346 Physical Chemistry II (3)	
CHM 348 Physical Chemistry Laboratory I (1)	
CHM 349 Physical Chemistry Laboratory II (1)	
Minimum total	24

¹ Equivalent courses may be taken in place of CHM 113, 115, or 116.

² Both CHM 231 and 235 must be taken to secure *SQ* credit.

SECONDARY EDUCATION—B.A.E.

Chemistry. Students may pursue one of two options for the chemistry major teaching field.

Option One. The academic specialization consists of 43 semester hours in chemistry plus work in related fields.

Required courses are as follows:

BCH 361 Principles of Biochemistry.....	3
CHM 113 General Chemistry <i>SQ</i>	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i>	5
CHM 325 Analytical Chemistry	3
CHM 326 Analytical Chemistry Laboratory	1
CHM 331 General Organic Chemistry	3
CHM 332 General Organic Chemistry	3

NOTE: For the General Studies requirement, courses, and codes (such as L, *SQ*, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CHM 335 General Organic Chemistry Laboratory.....	1
CHM 336 General Organic Chemistry Laboratory.....	1
CHM 341 Elementary Physical Chemistry.....	3
or CHM 345 Physical Chemistry I (3)	
and CHM 346 Physical Chemistry II (3)	
Total	27

The remaining chemistry courses to complete the specialization are determined by students in consultation with their advisors.

Additional required related field courses are as follows:

MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
PHY 111 General Physics <i>SQ</i> *.....	3
PHY 112 General Physics <i>SQ</i> *.....	3
PHY 113 General Physics Laboratory <i>SQ</i> *.....	1
PHY 114 General Physics Laboratory <i>SQ</i> *.....	1
Total	16

* Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure *SQ* credit.

Option Two. The academic specialization consists of 30 semester hours of chemistry, which includes all of the required chemistry courses listed in option one and selection of the corresponding option in either mathematics or physics, that is, completion of an additional 30 semester hours in the chosen area as specified by the department selected.

Minor Teaching Field. The minor teaching field consists of the following required courses:

CHM 113 General Chemistry <i>SQ</i>	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i>	5
Choose between the course combinations below.....	10 or 8
BCH 361 Principles of Biochemistry (3)	
CHM 231 Elementary Organic Chemistry <i>SQ</i> * (3)	
CHM 325 Analytical Chemistry (3)	
CHM 326 Analytical Chemistry Laboratory (1)	
_____ or _____	
CHM 331 General Organic Chemistry (3)	
CHM 332 General Organic Chemistry (3)	
CHM 335 General Organic Chemistry Laboratory (1)	
CHM 336 General Organic Chemistry Laboratory (1)	
CHM 341 Elementary Physical Chemistry.....	3
Total	20 or 22

* Both CHM 231 and 235 must be taken to secure *SQ* credit.

The remaining courses to complete the specialization are determined by students in consultation with their advisors.

GRADUATE PROGRAMS

The faculty in the Department of Chemistry and Biochemistry offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the *Graduate Catalog* for requirements.

The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. For more information, visit the program office in LSE 411, or call 480/965-0743.

BIOCHEMISTRY (BCH)

BCH 361 Principles of Biochemistry. (3)

fall and summer

Structures, properties, and functions of proteins, enzymes, nucleic acids, carbohydrates, and lipids; the utilization and synthesis of these materials by living systems, and the relationship of these processes to energy production and utilization. Credit is allowed for only BCH 361 or 461. Prerequisite: CHM 231 or 318 or 332.

BCH 367 Elementary Biochemistry Laboratory. (1)

fall and summer

Qualitative/quantitative analyses of constituents of biological systems, enzyme activity measurements and metabolic studies. 1 hour conference, 3 hours lab. Pre- or corequisite: BCH 361 or instructor approval.

BCH 392 Introduction to Research Techniques. (1-3)

fall, spring, summer

Instrumental methods and philosophy of research by actual participation in chemical research projects. May be repeated for total of 6 semester hours. Prerequisite: advisor and research supervisor approval.

BCH 461 General Biochemistry. (3)

fall

Structure, chemistry, and metabolism of biomolecules and their role in the biochemical processes of living organisms. Credit is allowed for only BCH 461 or 361. Prerequisite: CHM 318 or 332. Corequisite: CHM 341 or 346.

BCH 462 General Biochemistry. (3)

spring

Continuation of BCH 461. Prerequisite: BCH 461 or instructor approval.

BCH 463 Biophysical Chemistry. (3)

spring

Principles of physical chemistry as applied to biological systems. Prerequisite: CHM 341 or 346.

BCH 464 Biophysical Chemistry Laboratory. (2)

fall

Introduction to physical methods in modern biochemistry. Prerequisite: BCH 463.

BCH 467 Analytical Biochemistry Laboratory. (3)

spring

Quantitative analysis, separation and purification of biological molecules. Application of chemical and physical methods to the characterization of biological macromolecules. 1 conference, 1 hour lecture, 5 hours lab. Prerequisite: BCH 461. Corequisite: BCH 462.

General Studies: L

BCH 494 Special Topics. (1-4)

not regularly offered

Possible topics:

- (a) Topics in Nucleic Acids Biochemistry. (2)
- (b) Topics in Protein Biochemistry. (2)

BCH 501 Current Topics in Biochemistry. (1)

fall and spring

May be repeated for credit. Seminar. Prerequisite: instructor approval.

BCH 561 Advanced Topics in Biochemistry. (3)

spring

Topics selected from emerging areas of biochemistry based primarily on current literature. Prerequisite: BCH 462.

BCH 563 Biophysical Chemistry. (3)

not regularly offered

Physical chemistry of macromolecules, especially proteins, nucleic acids, and polysaccharides. Thermodynamics, hydrodynamics, and spectroscopy of and their relation to structure. Prerequisites: BCH 462; CHM 346.

BCH 568 Molecular Mechanisms of Photosynthesis. (3)

spring

Structure and function of photosynthetic complexes; mechanism of energy conversion in plants, bacteria, and model systems. Cross-listed as PLB 558. Credit is allowed for only BCH 568 or PLB 558. Prerequisite: instructor approval.

CHEMISTRY (CHM)**CHM 101 Introductory Chemistry. (4)***fall, spring, summer*

Elements of general chemistry. Adapted to the needs of students in nursing, home economics, agriculture, and physical education. Recommended for General Studies credit. Normally followed by CHM 231. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee.

*General Studies: SQ***CHM 107 Chemistry and Society. (4)***fall and spring*

General chemical principles and concepts presented in context of social and technological issues, e.g., energy, pollution, global warming, and others. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee.

*General Studies: SQ***CHM 113 General Chemistry. (4)***fall, spring, summer*

Principles of chemistry. Adapted to the needs of students in the physical, biological, and earth sciences. 1 year of high school chemistry recommended. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. Prerequisite: MAT 106 or 3 semesters of high school algebra.

*General Studies: SQ***CHM 114 General Chemistry for Engineers. (4)***fall and spring*

One semester college chemistry with emphasis toward engineering. Students without high school chemistry or chemical engineering majors must enroll in the CHM 113, 116 sequence instead of CHM 114. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117 and for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. Prerequisites: MAT 106 (or 3 semesters of high school algebra); 1 year of high school chemistry.

*General Studies: SQ***CHM 115 General Chemistry with Qualitative Analysis. (5)***fall, spring, summer*

Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals, and metalloids and the introduction to organic chemistry. Laboratory includes qualitative analysis. Credit is allowed for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 2 hours discussion, 4 hours lab. Fee. Prerequisite: CHM 113 or 2 years of high school chemistry.

*General Studies: SQ***CHM 116 General Chemistry. (4)***fall and spring*

Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals, and metalloids and the introduction to organic chemistry. Credit is allowed for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. Prerequisite: CHM 113 or 2 years of high school chemistry.

*General Studies: SQ***CHM 117 General Chemistry for Majors I. (4)***fall*

Atomic and molecular structure, properties and physical states of matter, thermodynamics, kinetics, acids and bases, chemical analysis, and stoichiometry. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 conference, 2 hours lab. Fee. Prerequisites: 3 years of high school mathematics; minimum of 1 year of high school physics. Prerequisite with a grade of "B" or higher: minimum of 1 year of high school chemistry.

*General Studies: SQ***CHM 118 General Chemistry for Majors II. (4)***spring*

Continuation of CHM 117. Credit is allowed for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 1 conference, 2 hours lab. Fee. Prerequisite: CHM 117. Corequisite: MAT 270.

*General Studies: SQ***CHM 231 Elementary Organic Chemistry. (3)***fall and spring*

Survey of organic chemistry, with emphasis on the reactivity of basic functional groups. Credit is allowed for only CHM 231 or 317 or 331. Prerequisite with a grade of "B" or higher: CHM 101 or 114 or 115 or 116 or 117 or 1 year of high school chemistry or instructor approval.

*General Studies: SQ (if credit also earned in CHM 235)***CHM 235 Elementary Organic Chemistry Laboratory. (1)***fall and spring*

Organic chemistry experiments in synthesis, purification, analysis, and identification. Lab. Fee. Pre- or corequisite: CHM 231.

*General Studies: SQ (if credit also earned in CHM 231)***CHM 240 Introduction to Physical Chemistry. (3)***spring*

Introduces mathematical/computational methods in chemical kinetics, thermodynamics, quantum chemistry. Mathematical-based computer laboratory. 2 hours lecture, 4 hours lab. Prerequisite with a grade of "C" or higher: MAT 272.

CHM 302 Environmental Chemistry. (3)*spring*

Explores major environmental issues, problems, and solutions from analytical and chemistry perspectives. Prerequisites: CHM 114 (or 115 or 116 or 118), 231 (or 331).

CHM 317 Organic Chemistry for Majors I. (3)*fall*

Structures, reaction mechanisms and kinetics, and systematic syntheses of organic compounds. Credit is allowed for only CHM 231 or 317 or 331. Prerequisite: CHM 115 or 118. Corequisite: CHM 319.

CHM 318 Organic Chemistry for Majors II. (3)*spring*

Continuation of CHM 317. Credit is allowed for only CHM 318 or 332. Prerequisite: CHM 317. Corequisite: CHM 320.

CHM 319 Organic Chemistry Laboratory for Majors I. (1)*fall*

Emphasis on mechanisms, kinetics, and products of organic reactions. Credit is allowed for only CHM 319 or 335. 1 conference, 3 hours lab. Fee. Pre- or corequisite: CHM 317.

CHM 320 Organic Chemistry Laboratory for Majors II. (1)*spring*

Continuation of CHM 319. Credit is allowed for only CHM 320 or 336. 1 conference, 3 hours lab. Fee. Prerequisite: CHM 319. Corequisite: CHM 318.

CHM 325 Analytical Chemistry. (3)*fall and summer*

Principles and methods of chemical analysis. Prerequisite: CHM 115 or 116.

CHM 326 Analytical Chemistry Laboratory. (1)*fall and summer*

Experiments in chemical analysis. 4 hours lab. Fee. Corequisite: CHM 325.

CHM 327 Instrumental Analysis. (3)*spring*

Principles of instrumental methods in chemical analysis. Electroanalytical and optical techniques. Prerequisites: CHM 325, 326. Pre- or corequisite: CHM 346.

CHM 328 Instrumental Analysis Laboratory. (2)*spring*

Experiments in chemical analysis by electroanalytical and optical techniques. 6 hours lab. Fee. Corequisite: CHM 327.

CHM 331 General Organic Chemistry. (3)*fall, spring, summer*

Chemistry of organic compounds. Credit is allowed for only CHM 231 or 317 or 331. Prerequisite: CHM 115 or 116 or 118.

CHM 332 General Organic Chemistry. (3)*fall, spring, summer*

Continuation of CHM 331. Credit is allowed for only CHM 318 or 332. Prerequisite: CHM 331.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CHM 335 General Organic Chemistry Laboratory. (1)*fall, spring, summer*

Microscale organic chemical experiments in separation techniques, synthesis, analysis and identification, and relative reactivity. Credit is allowed for only CHM 319 or 335. 4 hours lab. Fee. Corequisite: CHM 331.

CHM 336 General Organic Chemistry Laboratory. (1)*fall, spring, summer*

Continuation of CHM 335. Credit is allowed for only CHM 320 or 336. 4 hours lab. Fee. Prerequisite: CHM 335. Corequisite: CHM 332.

CHM 341 Elementary Physical Chemistry. (3)*fall*

Thermodynamics, equilibrium, states of matter, solutions, and chemical kinetics. For students in premedical, biological, and educational curricula. Prerequisites: CHM 115 (or 114 or 118 or 325), 231 (or 331); MAT 271; PHY 112.

CHM 343 Physical Chemistry Laboratory. (1)*fall*

Physical chemistry experiments. Credit is allowed for only CHM 343 or both CHM 348 and 349. 1 hour conference, 3 hours lab. Fee. Corequisite: CHM 341 or 345.

CHM 345 Physical Chemistry I. (3)*fall*

Introduction to quantum chemistry with application to electronic structure and dynamics of atoms and molecules. Prerequisite: only CHM 240 or both MAT 272 and 274 (with grades of "C" or higher).

CHM 346 Physical Chemistry II. (3)*spring*

Introduction to equilibrium and statistical thermodynamics. Laws of thermodynamics, equations of state, multicomponent chemical and phase equilibria, and electrochemistry. Prerequisite: CHM 345. Corequisite: MAT 274.

CHM 348 Physical Chemistry Laboratory I. (1)*fall*

Laboratory experiments in spectroscopy and computational chemistry. 4 hours lab. Fee. Pre- or corequisite: CHM 345.

General Studies: L (if credit also earned in CHM 349 and 452)

CHM 349 Physical Chemistry Laboratory II. (1)*spring*

Laboratory experiments in thermodynamics, electrochemistry, and computational chemistry. 4 hours lab. Fee. Pre- or corequisite: CHM 346.

General Studies: L (if credit also earned in CHM 348 and 452)

CHM 392 Introduction to Research Techniques. (1–3)*fall, spring, summer*

Instrumental methods and philosophy of research by actual participation in chemical research projects. May be repeated for a total of 6 semester hours. Prerequisite: approval of advisor and research supervisor.

CHM 424 Separation Science. (3)*not regularly offered*

Basic theory and practical aspects of gas, liquid, ion-exchange, and gel-permeation chromatographies, and other important industrial and research techniques. 2 hours lecture, 4 hours lab. Fee. Prerequisite: CHM 318 or 332 or 346 or instructor approval.

CHM 431 Qualitative Organic Analysis. (3)*spring*

Systematic identification of organic compounds. 1 hour lecture, 6 hours lab. Fee. Prerequisites: both CHM 118 (or 327) and 320 (or 336) or only instructor approval.

CHM 452 Inorganic Chemistry Laboratory. (1–2)*fall*

Preparation and characterization of typical inorganic substances, emphasizing methods and techniques. 1 conference, 5 hours lab. Fee. Prerequisite: instructor approval.

General Studies: L (if credit also earned in CHM 348 and 349)

CHM 453 Inorganic Chemistry. (3)*fall*

Principles and applications of inorganic chemistry. Prerequisite: CHM 341 or 346.

CHM 460 Biological Chemistry. (3)*spring*

Structure and function of macromolecules and their involvement in the processing of energy and information by living cells. Prerequisites: CHM 318, 346, 453.

CHM 471 Solid-State Chemistry. (3)*fall*

Crystal chemistry, thermodynamics and electrochemistry of solids, nonstoichiometric compounds, diffusion and solid-state reactions, crystal growth, and selected topics. Pre- or corequisite: CHM 346 or instructor approval.

CHM 480 Methods of Teaching Chemistry. (3)*spring*

Organization and presentation of appropriate content of chemistry; preparation of reagents, experiments, and demonstrations; organization of stock rooms and laboratories; experience in problem solving. Fee. Prerequisite: instructor approval.

CHM 481 Geochemistry. (3)*spring*

Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere, and lithosphere. Cross-listed as GLG 481. Credit is allowed for only CHM 481 or GLG 481. Prerequisite: CHM 341 (or 346) or GLG 321.

CHM 485 Meteorites and Cosmochemistry. (3)*not regularly offered*

Chemistry of meteorites and their relationship to the origin of the earth, solar system, and universe. Cross-listed as GLG 485. Credit is allowed for only CHM 485 or GLG 485.

CHM 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

(a) Chemistry of Global Climate Change. (3)

CHM 501 Current Topics in Chemistry. (1)*fall and spring*

May be repeated for credit. Prerequisite: instructor approval.

CHM 521 Computer-Enhanced Analytical Chemistry. (3)*not regularly offered*

Overview of chemometric tools in analytical chemistry, including multivariate calibration, spectral deconvolution, and experimental design. 2 hours lecture, 4 hours lab.

CHM 523 Advanced Analytical Chemistry. (3)*once a year*

Theoretical principles of analytical instrumentation and measurements. Prerequisites: both CHM 325 and 346 or only instructor approval.

CHM 525 Spectrochemical Methods of Analysis. (4)*not regularly offered*

Theoretical and practical considerations involving the use of optical instruments for chemical analyses. Emphasis on state-of-the-art trends. 3 hours lecture, 3 hours lab. Prerequisite: CHM 346 or instructor approval.

CHM 526 X-ray Methods of Analysis. (4)*not regularly offered*

Theoretical and practical considerations involving the use of X-ray diffraction and spectroscopy for chemical and structural analyses. 3 hours lecture, 3 hours lab. Prerequisite: CHM 346.

CHM 527 Electrical Methods of Chemical Analysis. (4)*not regularly offered*

Theoretical and practical considerations of polarographic, potentiometric, amperometric techniques, including modern electrochemical methods. 2 hours lecture, 6 hours lab. Prerequisite: CHM 346.

CHM 531 Advanced Organic Chemistry I. (3)*fall*

Reaction mechanisms, reaction kinetics, linear free energy relationships, transition state theory, molecular orbital theory, and Woodward-Hoffmann rules. Prerequisites: CHM 318 (or 332), 346.

CHM 532 Advanced Organic Chemistry II. (2)*spring*

Continuation of CHM 531. Prerequisite: CHM 531.

CHM 537 Organic Reactions. (3)*spring*

Important synthetic reactions of organic chemistry emphasizing recently discovered reactions of preparative value. Prerequisite: CHM 531.

CHM 541 Advanced Thermodynamics. (3)*fall*

Equilibrium thermodynamics, chemical reactions, and phase equilibria. Introduction to statistical thermodynamics, critical phenomena, and kinetics. Prerequisite: CHM 346.

CHM 545 Quantum Chemistry I. (3)*fall*

Basic quantum theory, chemical bonding, and molecular structure. Prerequisite: CHM 346.

CHM 546 Quantum Chemistry II. (3)*spring*

Quantum theory of rate processes. Principles of spectroscopy and nonlinear optics. Prerequisite: CHM 545.

CHM 548 Chemical Kinetics. (2)*not regularly offered*

Kinetic theory and rate processes. Prerequisite: CHM 545.

CHM 553 Advanced Inorganic Chemistry. (3)*spring*

Principles of modern inorganic chemistry and their applications over the entire periodic system. Prerequisites: CHM 346 and 453 (or their equivalents).

CHM 556 Topics in Inorganic Chemistry. (3)*not regularly offered*

May be repeated for credit. Prerequisites: CHM 553; instructor approval.

CHM 579 Topics in Solid-State Chemistry. (3)*not regularly offered*

May be repeated for credit. Prerequisite: instructor approval.

CHM 582 Topics in Geochemistry and Cosmochemistry. (3)*not regularly offered*

Topics of current interest for students in chemistry and other fields. Sampling of data and thought concerning phase equilibria, element distribution, meteorites, the Earth, and other planets. May be repeated for credit. Prerequisite: instructor approval.

CHM 583 Phase Equilibria and Geochemical Systems. (3)*not regularly offered*

Natural reactions at high temperatures and pressures; silicate, sulfide, and oxide equilibria. Cross-listed as GLG 583. Credit is allowed for only CHM 583 or GLG 583. Prerequisite: instructor approval.

CHM 593 Applied Project. (1–12)*not regularly offered*

Possible topics:

- (a) Glass Blowing
Fee.

sions and service to the community based on an understanding of the humanities, social sciences, and the arts.

CHICANA AND CHICANO STUDIES—B.A.

The major in Chicana and Chicano Studies requires 45 semester hours of course work. A minimum of 30 semester hours must be CCS, CSH, and CSS courses. The remaining course work must be in a related field to be approved by an advisor. All CCS majors must take 15 semester hours in the following core courses:

CCS 101 Introduction to Chicana and Chicano Studies C	3
CCS 111 Introduction to Chicana and Chicano Culture C	3
CCS 498 Pro-Seminar	3
Two semester sequence in Chicana and Chicano history	6

Within the 45 semester hours, CCS majors must also take 18 semester hours in one of two concentrations—humanities/cultural studies or social sciences/policy—and 12 hours in the other concentration for a total of 45 semester hours.

Majors are expected to fulfill the college's language requirement in Spanish. Although the department advisor can make exceptions on a case by case basis, all majors must demonstrate proficiency in Spanish.

All Chicana and Chicano Studies majors must take an established minor or credential of at least 18 semester hours in another field.

CHICANA AND CHICANO STUDIES MINOR

The Chicana and Chicano Studies minor requires 18 semester hours of course work. All Chicana and Chicano Studies minors must take the following courses:

CCS 101 Introduction to Chicana and Chicano Studies C	3
or CCS 111 Introduction to Chicana and Chicano Culture C (3)	3
HST 417 Topics in Mexican American History SB, C, H	3
Total	6

Students must also take at least three credits in both CCS concentrations: humanities/cultural studies and social sciences/policy.

Within the 18 semester hour requirement, students must take a minimum of 12 semester hours in CCS, CSH, and CSS courses. Any courses taken in a related field must be approved by an advisor.

CHICANA AND CHICANO STUDIES (CCS)**CCS 101 Introduction to Chicana and Chicano Studies. (3)***fall*

Historical and contemporary issues in the Chicana and Chicano community; focus on economic, sociological, cultural, and political status of Chicanas and Chicanos in the U.S.

*General Studies: C***CCS 111 Introduction to Chicana and Chicano Culture. (3)***spring*

Interdisciplinary analysis of customs, values, belief systems, and cultural symbols; special attention is given to cultural continuity and change.

General Studies: C

Department of Chicana and Chicano Studies

Vicki L. Ruiz

Chair

(COWDN 224) 480/965-5091

www.asu.edu/clas/chicana**PROFESSORS**

CANDELARIA, MONTIEL, PADILLA, RUIZ

ASSOCIATE PROFESSOR

ESCOBAR

ASSISTANT PROFESSORS

ALDAMA, GUTIÉRREZ, MAGAÑA

The Chicana and Chicano Studies program is an interdisciplinary degree program that examines the experiences, culture, artistic endeavors, and current status of people of Mexican descent living in the United States. The curriculum focuses on the practical application of Chicana and Chicano Studies (CCS) for career development in selected profes-

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CCS 210 Introduction to Ethnic Studies in the U.S. (3)*fall and spring*

Covers diversity of experiences and relations among racial and ethnic groups in the United States. Lecture, discussion. Cross-listed as AFH 210/APA 210. Credit is allowed for only AFH 210 or APA 210 or CCS 210.

*General Studies: C***CCS 300 Chicana and Chicano Culture and Society. (3)***fall*

Intensive analysis of how Mexican American writers, artists, film makers, entertainers, and academicians have interpreted aspects of the Chicana and Chicano experience.

*General Studies: C***CCS 445 Teaching Chicana and Chicano Studies in Native Language. (3)***once a year*

Approaches/techniques for infusion of Chicana and Chicano Studies content into elementary and secondary bilingual curriculum. Taught in Spanish. Prerequisite: proficiency in Spanish.

CCS 446 Teaching Chicana and Chicano Studies in the Schools. (3)*once a year*

Approaches/techniques for infusion of Chicana and Chicano Studies content into elementary and secondary curriculum; designed for teachers who work with Chicana and Chicano students.

CCS 498 Pro-Seminar. (3)*once a year*

Required courses for majors on topic selected by instructor; writing-intensive course related to the development of interdisciplinary research skills.

CHICANA AND CHICANO STUDIES HUMANITIES (CSH)

CSH Note 1. Completion of the First-Year Composition requirement (ENG 101 and 102 [or 105] or ENG 107 and 108 with a grade of "C" or higher) is a prerequisite for all English courses above the 100 level.

CSH Note 2. A term paper or equivalent out-of-class written work is required in all upper-division (300- and 400-level) ENG courses.

CSH 210 Chicana and Chicano Poetry. (3)*spring*

Writing seminar on Chicana and Chicano poetics and intensive creative writing workshop. Workshop, seminar.

CSH 220 Chicana and Chicano Cultural Expression. (3)*once a year*

Interrelation between economic, social, and political status and forms of artistic expression; i.e., music, dance, drama, literature, and graphic arts.

CSH 310 Chicana and Chicano Folklore. (3)*once a year*

Analysis of Chicana and Chicano folk beliefs, traditions, and practices.

*General Studies: HU, C***CSH 350 Mexican and Mexican American Artistic Production. (3)***once a year*

Overview of Mexican and Mexican American artistic production from colonial times to present; emphasis on religious and folk art.

CSH 351 Contemporary Chicana and Chicano Art. (3)*once a year*

Intensive analysis of contemporary Chicana and Chicano art movement as appraised within the context of contemporary American art and the art of Mexico.

*General Studies: HU, C***CSH 363 Chicana and Chicano Literature. (3)***fall*

Development of Chicana and Chicano literature; study of genres and themes; attention to literary antecedents. Cross-listed as ENG 363.

Credit is allowed for only CSH 363 or ENG 363. See CSH Notes 1, 2.

*General Studies: L/HU, C***CSH 485 Chicana Writers. (3)***once a year*

Critical reading of Mexican American women authors; emphasis on contemporary (post-1970) poetry, novels, short stories, and essays.

*General Studies: L/HU, C***CSH 498 Pro-Seminar. (3)***once a year*

Required course for majors on topic selected by instructor; writing-intensive course related to the development of interdisciplinary research skills.

**CHICANA AND CHICANO STUDIES
SOCIAL SCIENCE (CSS)****CSS 315 Chicano Family Structures and Perceptions. (3)***once a year*

Traditional and changing family relationships; emphasis on gender and intergenerational relations and impact of modern society on traditional family values.

CSS 330 Chicana and Chicano Politics and Policy. (3)*once a year*

Historical/contemporary analysis of Chicana and Chicano political ideologies, attitudes, strategies, and movements; relations with governmental agencies; and public policy issues.

*General Studies: C***CSS 331 Policy Issues in Chicana and Chicano Urban Settings. (3)***spring*

Historical, demographic, and sociological overview of the status of Chicanas and Chicanos in urban settings as well as the public policy relevance.

*General Studies: C***CSS 336 Issues in Immigration and Migration. (3)***once a year*

Historical/contemporary overview of Mexican immigration into and within the U.S.; factors affecting population movement, settlement patterns, and migrants' incorporation into society.

*General Studies: C, H***CSS 340 Chicanas and Chicanos in the U.S. Economy. (3)***spring*

Historical/contemporary analysis of Chicanas' and Chicanos' relationship with the American economic system; emphasis on impact of changing American economy on Chicana and Chicano community.

*General Studies: C***CSS 432 Issues in Chicana and Chicano Gender. (3)***once a year*

Analysis of social construction of gender identities; emphasis on impact of American and Mexican cultural values on normative gender relations.

*General Studies: C***CSS 490 Field Studies in the Chicana and Chicano Community. (3)***once a year*

Introduction to principles and methods of qualitative research applied to the Chicana and Chicano community.

CSS 498 Pro-Seminar. (3)*once a year*

Required course for majors on topic selected by instructor; writing-intensive course related to the development of interdisciplinary research skills.

Computer Science

A major in Computer Science is offered in both the College of Liberal Arts and Sciences and the College of Engineering and Applied Sciences. For faculty and course descriptions, see "Department of Computer Science and Engineering," page 236.

COMPUTER SCIENCE—B.S.

The program in Computer Science consists of 34 hours of core course work and 15 semester hours of senior-level breadth courses in the major. Also required are 18 semester hours of technical elective and mathematics courses

approved by the department. The university requirement for literacy and critical inquiry is to be met in part by ECE 400 or a General Studies L course approved by the department.

A minimum cumulative GPA of 2.50 is required to begin upper-division work in the major. A minimum grade of “C” is required in all CSE courses used for degree credit.

For more information, contact an advisor in the Office for Academic Programs in SS 111, or the Computer Science and Engineering Advising Center in GWC 224.

The degree is accredited by the Computer Science Accreditation Board, so more than 120 semester hours are required to complete the degree.

Economics

The College of Liberal Arts and Sciences and the College of Business offer a B.A. or B.S. degree in Economics. Faculty, course descriptions, and the major requirements in the College of Business are listed under “Department of Economics,” page 160. For more information, CLAS Economics majors should call the faculty liaison at 480/965-2128 or visit BAC 655.

ECONOMICS—B.A. OR B.S.

The program in Economics consists of 45 semester hours of course work, 24 of which, at a minimum, must be in economics, and the remainder in closely related fields to be selected from the “Approved List of Related Field Courses” in consultation with the faculty advisor.

The following lower-division courses are required and must be counted as part of the 45-hour major:

ECN 111 Macroeconomic Principles <i>SB</i>	3
ECN 112 Microeconomic Principles <i>SB</i>	3
MAT 210 Brief Calculus <i>MA</i>	3
STP 226 Elements of Statistics <i>CS</i>	3
Total	12

While MAT 210 meets the minimum mathematics requirement to major in Economics, all Economics majors who anticipate going on to graduate school in economics or in business or to law school are encouraged to take MAT 270 Calculus with Analytic Geometry I. Majors are encouraged to pursue further course work in mathematics. MAT 270 may be taken in lieu of MAT 210.

To qualify for upper-division course work in economics, the Economics major must earn a minimum grade of “C” in each of the previously listed courses, have junior class standing (56 semester hours), and have a minimum cumulative GPA of 2.50. ECN 313 Intermediate Macroeconomic Theory and ECN 314 Intermediate Microeconomic Theory are required and should be taken after the completion of the previously listed courses and before other upper-division courses in economics.

Credit earned by an Economics major in ECN 484 Economics Internship, whether as a legislative intern or through

the Department of Economics Internship Program (and ECN 493 Honors Thesis), may not be used to satisfy the minimum 24 hours of economics course work requirement. However, up to six hours of ECN 484 and 493 may be used to meet the related fields requirement. See “College Degree Requirements,” page 319.

Latin American Studies Certificate or Emphasis. Students majoring in Economics may elect to pursue a Latin American Studies Certificate or emphasis, combining courses from the major with selected outside courses of wholly Latin American content. See “Latin American Studies,” page 326, for more information.

MINORS IN ECONOMICS

Minor in General Economics. The minor in General Economics consists of 18 semester hours of credit which includes ECN 111 and 112 plus any 12 hours of upper-division economics courses for which all prerequisites have been met.

Minors in General Economics are encouraged to take calculus and statistics, which are prerequisites for ECN 313 Intermediate Macroeconomic Theory and ECN 314 Intermediate Microeconomic Theory so that these courses might be included in the minor. The College of Business does not permit its professional program students to enroll in this minor.

Minor in Economics for Students Planning a Career in Law. One of the most dramatic recent developments in law is the integration of economic analysis in legal theory and decision making. Curricula at all major law schools reflect this change. Consequently, future lawyers are being trained with courses that rely increasingly on microeconomic theory and econometrics.

The applications of economics to law have moved beyond the traditional areas of antitrust and regulation. First-year law courses now include microeconomic theory with applications to contracts, torts, criminal law, property, and constitutional law.

The minor in Economics for Students Planning a Career in Law provides an opportunity for prospective law students to take courses that provide them with analytical tools essential for the study of law. The prelaw minor consists of a minimum of 18 semester hours. The College of Business does not permit its professional program students to enroll in this minor.

Required courses are as follows:

ECN 111 Macroeconomic Principles <i>SB</i>	3
ECN 112 Microeconomic Principles <i>SB</i>	3
ECN 314 Intermediate Microeconomic Theory <i>SB</i>	3
ECN 450 Law and Economics <i>L</i>	3
ECN 453 Government and Business	3
Total	15

Also required is at least one additional course from the following:

ACC 316 Management Uses of Accounting	3
ECN 421 Earnings and Employment <i>L/SB</i>	3
ECN 480 Introduction to Econometrics <i>CS</i>	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

ECN 494 ST: Public Choice	3
FIN 361 Managerial Finance.....	3

SECONDARY EDUCATION—B.A.E.

The minor teaching field consists of 21 semester hours. ECN 111 Macroeconomic Principles and ECN 112 Microeconomic Principles and MAT 210 Brief Calculus are required. The remainder must be approved by the advisor in consultation with the student.

Social Studies. See “Social Studies,” page 446.

GRADUATE PROGRAMS

The faculty in the Department of Economics offer programs leading to the M.S. and Ph.D. degrees. See the *Graduate Catalog* for requirements.

For faculty and course descriptions see “Department of Economics,” page 160.

Department of English

Daniel Bivona

Chair

(LL 542) 480/965-3168

www.asu.edu/clas/english

REGENTS' PROFESSORS

DUBIE, RÍOS

PROFESSORS

ADAMS, BENDER, BJORK, BOYER, BRACK, BRINK, CANDELARIA, CARLSON, CROWLEY, DONELSON, GUTIERREZ, HELMS, KEHL, LESTER, LIGHTFOOT, MAJOR, A. NILSEN, D. NILSEN, RHODES, RICHARD, ROEN, SANDS, SENSIBAR

ASSOCIATE PROFESSORS

BATES, BIVONA, CASTLE, CHANCY, CORSE, DeLAMOTTE, GOGGIN, GOLDBERG, HORAN, LUSSIER, MAHONEY, McNALLY, MILLER, MORGAN, NELSON, PERRY, PRITCHARD, RAMAGE, SAVARD, SCHWALM, TOHE, van GELDEREN

ASSISTANT PROFESSORS

BLASINGAME, FUSE, HARRIS, JOHNSON, MILUN, STEVENS, VOADEN, WEBB PETERSON

SENIOR LECTURERS

COOK, COOPER, DUGAN, OBERMEIER, SUDOL

LECTURERS

DUERDEN, DWYER, HEENAN, NORTON, RAY, WHEELER

ACADEMIC PROFESSIONAL

GLAU

ENGLISH—B.A.

The faculty in the Department of English offer courses in comparative literature, creative writing, English as a second language, English education, English linguistics, literature and language, and rhetoric and composition. Undergraduate degrees include the B.A. degree in English, with a concentration in either linguistics or literature, and a Secondary

Education Bachelor of Arts in Education degree. The faculty also offer a Writing Certificate. Students interested in creative writing are encouraged to use electives to pursue a creative writing emphasis. Students should work with advisors to design an individual program of study that takes full advantage of the diversity within the department as well as interdisciplinary and multicultural contexts available in the college and university.

The B.A. degree in English with a concentration in linguistics consists of 42 semester hours. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature <i>L/HU</i>	3
ENG 213 Introduction to the Study of Language	3
ENG 221 Survey of English Literature <i>HU, H</i>	3
or ENG 222 Survey of English Literature <i>HU, H</i> (3)	
or ENG 241 American Literature <i>HU</i> (3)	
or ENG 242 American Literature <i>HU</i> (3)	
ENG 312 English in Its Social Setting <i>HU/SB</i>	3
ENG 313 Phonology and Morphology	3
ENG 314 Modern Grammar.....	3
ENG 413 History of the English Language <i>HU</i>	3
ENG 414 Studies in Linguistics (repeated for a total of nine semester hours)	9

Twelve additional hours are electives, chosen in consultation with the student's advisor. These courses must be at the 200 level or above. At least one must be a three-credit course in a modern language other than English at the 400 level or above. A grade of “C” or higher is required in all courses taken for the major. *No course may be used to satisfy more than one requirement.*

The B.A. degree in English with a concentration in literature consists of 45 semester hours. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature <i>L/HU</i>	3
ENG 221 Survey of English Literature <i>HU, H</i>	3
ENG 222 Survey of English Literature <i>HU, H</i>	3
ENG 241 American Literature <i>HU</i>	3
ENG 242 American Literature <i>HU</i>	3
ENG 421 Shakespeare <i>HU</i>	3

Courses taken to fulfill the areas and periods listed below can be used to satisfy more than one of these requirements:

- Upper-division course in critical theory (3)
- Upper-division course in gender, American ethnic literatures, and/or postcolonial studies (3)
- Course in the history and/or structure of language (3)
- Upper-division course in literature before 1660 exclusive of ENG 421 (3)
- Upper-division course in literature between 1660 and 1900 (3)
- Upper-division course in literature after 1900 (3)

Additional hours needed to complete the 45 hours are electives chosen from the department's offerings at the 200 level and above. At least 18 of the 45 hours must be taken at the 300 or 400 level. A grade of “C” or higher is required in all courses taken for the major.

MINORS

The minor in English with a Concentration in Linguistics consists of 24 semester hours. Required courses are as follows:

ENG 200	Critical Reading and Writing About Literature <i>L/HU</i>	3
ENG 213	Introduction to the Study of Language	3
ENG 221	Survey of English Literature <i>HU, H</i>	3
	or ENG 222 Survey of English Literature <i>HU, H</i> (3)	
	or ENG 241 American Literature <i>HU</i> (3)	
	or ENG 242 American Literature <i>HU</i> (3)	
ENG 312	English in Its Social Setting <i>HU/SB</i>	3
ENG 314	Modern Grammar.....	3
ENG 413	History of the English Language <i>HU</i>	3

The six additional hours are electives chosen from the department's offerings, with at least one course (three hours) required at the 300 or 400 level. A grade of "C" or higher is required in all courses for the minor.

The minor in English with a Concentration in Literature consists of 24 semester hours. Required courses are as follows:

ENG 200	Critical Reading and Writing About Literature <i>L/HU</i>	3
ENG 221	Survey of English Literature <i>HU, H</i>	3
	or ENG 222 Survey of English Literature <i>HU, H</i> (3)	
ENG 241	American Literature <i>HU</i>	3
	or ENG 242 American Literature <i>HU</i> (3)	
ENG 421	Shakespeare <i>HU</i>	3

Also required are two upper-division courses in literature (six hours) and two electives (six hours) chosen from among the department's offerings, with at least one course (three hours) at the 300 or 400 level. A grade of "C" or higher is required in all courses taken for the minor.

WRITING CERTIFICATE

The Writing Certificate consists of 19 semester hours. Initial entry into the program requires a minimum GPA of 3.00 in English 101 and 102, 105, or 107 and 108. Students must also have completed at least 30 hours of course work and must have a minimum GPA of 3.00. Required courses are as follows:

ENG 216	Persuasive Writing on Public Issues <i>L</i>	3
	or ENG 412 Professional Writing (3)	
ENG 301	Writing for the Professions <i>L</i>	3
ENG 372	Document Production <i>L</i>	3
ENG 472	Rhetorical Studies	3
ENG 484	Writing Internship	3
ENG 498	PS: Portfolio.....	1
Total	.....	16

Also required is an additional writing course in English (three hours) or a writing or design course (three hours) selected from an approved list of courses across campus. All students are required to submit a portfolio before receiving the certificate.

SECONDARY EDUCATION—B.A.E.

The major teaching field consists of 45 semester hours in English. Required courses are as follows:

ENG 200	Critical Reading and Writing About Literature <i>L/HU</i>	3
ENG 212	English Prose Style <i>L</i>	3
	or ENG 215 Strategies of Academic Writing <i>L</i> (3)	
	or ENG 216 Persuasive Writing on Public Issues <i>L</i> (3)	
	or ENG 217 Writing Reflective Essays <i>L</i> (3)	
ENG 221	Survey of English Literature <i>HU, H</i>	3
ENG 222	Survey of English Literature <i>HU, H</i>	3
ENG 241	American Literature <i>HU</i>	3
ENG 242	American Literature <i>HU</i>	3
ENG 312	English in Its Social Setting <i>HU/SB</i>	3
	or ENG 314 Modern Grammar (3)	
ENG 421	Shakespeare <i>HU</i>	3
ENG 471	Literature for Adolescents <i>HU</i>	3
ENG 480	Methods of Teaching English: Composition.....	3
ENG 482	Methods of Teaching English: Language.....	3
Total	.....	33

Also required is one course in women's literature or American ethnic literatures. Nine additional hours are electives chosen from Department of English offerings, six hours of which must be in the upper division. ENG 471, 480, and 482 must be taken before student teaching.

The minor teaching field consists of the following required courses:

ENG 200	Critical Reading and Writing About Literature <i>L/HU</i>	3
ENG 212	English Prose Style <i>L</i>	3
	or ENG 215 Strategies of Academic Writing <i>L</i> (3)	
	or ENG 216 Persuasive Writing on Public Issues <i>L</i> (3)	
	or ENG 217 Writing Reflective Essays <i>L</i> (3)	
ENG 221	Survey of English Literature <i>HU, H</i>	3
	or ENG 222 Survey of English Literature <i>HU, H</i> (3)	
ENG 241	American Literature <i>HU</i>	3
	or ENG 242 American Literature <i>HU</i> (3)	
ENG 312	English in Its Social Setting <i>HU/SB</i>	3
	or ENG 314 Modern Grammar (3)	
ENG 471	Literature for Adolescents <i>HU</i>	3
ENG 480	Methods of Teaching English: Composition.....	3
ENG 482	Methods of Teaching English: Language.....	3
Total	.....	24

These courses are also recommended for Elementary Education majors.

GRADUATE PROGRAMS

The faculty in the Department of English offer programs leading to the M.A. degree in English (with concentrations in comparative literature, English linguistics, literature and language, and rhetoric and composition), Master of Fine Arts degree in Creative Writing (options include fiction, nonfiction, poetry, and screenwriting), Master of Teaching English as a Second Language degree, and Ph.D. degree in English with two concentrations, one in literature and one in rhetoric/composition and linguistics. See the *Graduate Catalog* for requirements.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ENGLISH (ENG)

ENG Note 1. Completion of the First-Year Composition requirement (ENG 101 and 102 [or 105] or ENG 107 and 108 with a grade of "C" or higher) is a prerequisite for all English courses above the 100 level.

ENG Note 2. A term paper or equivalent out-of-class written work is required in all upper-division (300- and 400-level) ENG courses.

ENG Note 3. English majors and minors are expected to have completed ENG 200 before taking 400-level literature courses.

ENG 101 First-Year Composition. (3)

fall, spring, summer

Discovering, organizing, and developing ideas in relation to the writer's purpose, subject, and audience. Emphasis on modes of written discourse and effective use of rhetorical principles. Foreign students, see ENG 107. Prerequisite: see "University Testing Requirements," page 63, and "First-Year Composition Requirement," page 74.

ENG 102 First-Year Composition. (3)

fall, spring, summer

Critical reading and writing; emphasis on strategies of academic discourse. Research paper required. Foreign students, see ENG 108. Prerequisite with a grade of "C" or higher: ENG 101.

ENG 105 Advanced First-Year Composition. (3)

fall and spring

Concentrated composition course for students with superior writing skills; intensive reading; research papers; logical and rhetorical effectiveness. Not open to students with credit for First-Year Composition. Prerequisite: see "University Testing Requirements," page 63, and "First-Year Composition Requirement," page 74.

ENG 107 English for Foreign Students. (3)

fall and spring

For students from non-English-speaking countries who have studied English in their native countries, but who require practice in the idioms of English. Intensive reading, writing, and discussion. Satisfies the graduation requirement of ENG 101.

ENG 108 English for Foreign Students. (3)

fall and spring

For foreign students; critical reading and writing; strategies of academic discourse. Research paper required. Satisfies graduation requirement of ENG 102. Prerequisite with a grade of "C" or higher: ENG 107.

ENG 114 English Grammar and Usage. (3)

fall and spring

Fundamentals of English grammar (word and phrase structure) and of English usage (punctuation, grammatical correctness).

ENG 200 Critical Reading and Writing About Literature. (3)

fall and spring

Introduction to the terminology, methods, and objectives of the study of literature, with practice in interpretation and evaluation. See ENG Note 1. Prerequisite: English major or minor.

General Studies: L/HU

ENG 201 World Literature. (3)

fall

Classical and medieval periods. Selections from the great literature of the world in translation and lectures on the cultural background. See ENG Note 1.

General Studies: HU, H

ENG 202 World Literature. (3)

spring

Renaissance and modern periods. Selections from the great literature of the world in translation and lectures on the cultural background. See ENG Note 1.

General Studies: HU, H

ENG 204 Introduction to Contemporary Literature. (3)

once a year

Poetry, fiction, drama, and possibly other genres. See ENG Note 1.

General Studies: HU

ENG 210 Introduction to Creative Writing. (3)

fall and spring

Beginning writing of poetry, fiction, and drama (both stage and screen). Separate sections for each genre. Each genre may be taken once. See ENG Note 1.

ENG 212 English Prose Style. (3)

not regularly offered

Analysis and practice of writing in various classical and modern prose styles. See ENG Note 1. Prerequisite: preferably English major or both approval of advisor and instructor. Prerequisite with a grade of "B" or higher: ENG 102 (or 105).

General Studies: L

ENG 213 Introduction to the Study of Language. (3)

fall and spring

Language as code; phonetics, phonology, morphology, and syntax; the lexicon; language acquisition; sociolinguistics. See ENG Note 1.

ENG 215 Strategies of Academic Writing. (3)

fall and spring

Advanced course in techniques of analyzing and writing academic expository prose. Writing is research based. See ENG Note 1.

General Studies: L

ENG 216 Persuasive Writing on Public Issues. (3)

fall and spring

Advanced course in techniques of analyzing and writing persuasive arguments addressing topics of current public interest. Papers are research based. See ENG Note 1.

General Studies: L

ENG 217 Writing Reflective Essays. (3)

fall and spring

Critical examination of the influences discourse has on formation of identity; narrative analyses of self and culture. See ENG Note 1.

General Studies: L

ENG 218 Writing About Literature. (3)

fall and spring

Advanced writing course requiring analytical and expository essays about fiction, poetry, and drama. For non-English majors. See ENG Note 1.

General Studies: L

ENG 221 Survey of English Literature. (3)

fall and spring

Medieval, Renaissance, and 18th-century literature. Emphasis on major writers and their works in their literary and historical contexts. See ENG Note 1.

General Studies: HU, H

ENG 222 Survey of English Literature. (3)

fall and spring

Romantic, Victorian, and 20th-century literature. Emphasis on major writers and their works in their literary and historical contexts. See ENG Note 1.

General Studies: HU, H

ENG 241 American Literature. (3)

fall and spring

From colonial times to the Civil War, including the growth of nationalism and romanticism. See ENG Note 1.

General Studies: HU

ENG 242 American Literature. (3)

fall and spring

From the Civil War to the present. Development of realism, naturalism, and modernism, and contemporary trends in prose and poetry. See ENG Note 1.

General Studies: HU

ENG 245 Popular Culture Issues. (3)

fall and spring

Selected topics in various forms of popular culture related to written texts. May be repeated for credit when topics vary. See ENG Note 1.

General Studies: L

ENG 301 Writing for the Professions. (3)

fall and spring

Advanced practice in writing and editing expository prose. Primarily for preprofessional majors. See ENG Notes 1, 2.

General Studies: L

ENG 303 Classical Backgrounds of English Literature. (3)

not regularly offered

Selected readings of Greek and Latin literature in translation, emphasizing forms, ideas, and myths as they relate to literature in English. See ENG Notes 1, 2.

General Studies: HU

ENG 307 Utopian Literature. (3)*not regularly offered*

Selected works from the present to the classical period, including *Walden Two*, *Walden*, *Utopia*, and *The Republic*. See ENG Notes 1, 2.
General Studies: L/HU, H

ENG 310 Intermediate Creative Writing. (3)*fall and spring*

Separate sections for fiction and poetry. May be taken once for poetry, once for fiction. Lecture, writing assignments, discussion, criticism. See ENG Notes 1, 2. Prerequisite: ENG 210 or instructor approval.

ENG 312 English in Its Social Setting. (3)*fall and spring*

Introduction to the sociolinguistic study of the English language. See ENG Notes 1, 2.
General Studies: HU/SB

ENG 313 Phonology and Morphology. (3)*spring*

Introduction to English morphology, phonology, etymology, and phonetic aspects of rhyme, alliteration, and other sound-based literary devices. See ENG Notes 1, 2.

ENG 314 Modern Grammar. (3)*fall and spring*

Modern descriptive models of English grammar. See ENG Notes 1, 2.

ENG 321 Introduction to Shakespeare. (3)*fall and spring*

Shakespeare's major comedies, histories, and tragedies. See ENG Notes 1, 2.

*General Studies: L/HU***ENG 331 American Drama. (3)***once a year*

Major works in the development of American drama from its beginnings to the present. See ENG Notes 1, 2.

*General Studies: L***ENG 332 Major American Novels. (3)***once a year*

Novels from the 19th century to the present studied in their historical and cultural contexts. See ENG Notes 1, 2.

*General Studies: L***ENG 333 American Ethnic Literature. (3)***once a year*

Examination of America's multiethnic identity through works of literature that depict American ethnic, gender, and class sensibilities. Cross-listed as AFH 333. Credit is allowed for only AFH 333 or ENG 333. See ENG Notes 1, 2.

*General Studies: L, C***ENG 345 Selected Authors or Issues. (3–4)***not regularly offered*

Different topics may be offered. Film topics with lab may carry 4 credits. May be repeated for credit when topics vary. See ENG Notes 1, 2.

ENG 352 Short Story. (3)*fall and spring*

Development of the short story as a literary form; analysis of its technique from the work of representative authors. See ENG Notes 1, 2.

*General Studies: HU***ENG 353 African American Literature: Beginnings Through the Harlem Renaissance. (3)***fall*

Thematic and cultural study of African American literature through the Harlem Renaissance. Cross-listed as AFH 353. Credit is allowed for only AFH 353 or ENG 353. See ENG Notes 1, 2.

*General Studies: L/HU, C***ENG 354 African American Literature: Harlem Renaissance to the Present. (3)***spring*

Thematic and cultural study of African American literature from the Harlem Renaissance to the present. Cross-listed as AFH 354. Credit is allowed for only AFH 354 or ENG 354. See ENG Notes 1, 2.

*General Studies: L/HU, C***ENG 355 History of the Drama. (3)***not regularly offered*

Development of European drama from the Greek to the Romantic period. See ENG Notes 1, 2.

*General Studies: L/HU***ENG 356 The Bible as Literature. (3)***fall and spring*

Readings in Old and New Testaments, emphasizing ideas, literary types, and sources as they appear in literature. See ENG Notes 1, 2.

*General Studies: HU***ENG 357 Introduction to Folklore. (3)***not regularly offered*

Survey of the history, genres, and dynamics of folklore, with emphasis on oral traditions. See ENG Notes 1, 2.

*General Studies: HU***ENG 359 American Indian Literatures. (3)***not regularly offered*

Selected oral traditions of American Indians and their influences on contemporary Native American literary works. See ENG Notes 1, 2.

*General Studies: L/HU, C***ENG 361 Silent Film. (4)***fall*

Development of motion pictures from 1850 through 1930. 3 hours lecture, screenings. See ENG Notes 1, 2.

*General Studies: HU***ENG 362 Sound Film Genres. (4)***spring*

Examination of the western, the horror film, the comedy, and other genres. 3 hours lecture, screenings. See ENG Notes 1, 2.

*General Studies: HU***ENG 363 Chicana and Chicano Literature. (3)***fall*

Development of Chicana and Chicano literature; study of genres and themes; attention to literary antecedents. Cross-listed as CSH 363. Credit is allowed for only CSH 363 or ENG 363. See ENG Notes 1, 2.

*General Studies: L/HU, C***ENG 372 Document Production. (3)***fall and spring*

Introduction to document design and production. Practice in critique and in writing the content of publications. Lecture, discussion. See ENG Notes 1, 2. Prerequisite: instructor approval.

*General Studies: L***ENG 374 Technical Editing. (3)***fall and spring*

Fundamentals of editing technical and professional materials. Role of editors in analyzing, revising, and polishing manuscripts. Successful writer-editor dialogues. See ENG Notes 1, 2. Prerequisite: ENG 102 (or its equivalent).

ENG 400 History of Literary Criticism. (3)*not regularly offered*

Major critics and critical traditions in the Western world. Prerequisite: 6 hours in literature or instructor approval. See ENG Notes 1, 2.

*General Studies: HU***ENG 405 Style and Stylistics. (3)***not regularly offered*

Linguistic, rhetorical, and literary approaches to the analysis of style in poetry, fiction, and other forms of written discourse. See ENG Notes 1, 2.

ENG 409 Advanced Screenwriting. (3)*not regularly offered*

Application of the principles taught in a complete feature-length screenplay. See ENG Notes 1, 2.

ENG 411 Advanced Creative Writing. (3)*fall and spring*

Separate poetry and fiction workshops for experienced writers, emphasizing individual style. May be taken once for poetry, once for fiction. See ENG Notes 1, 2. Prerequisite: ENG 310 or instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ENG 412 Professional Writing. (3)*not regularly offered*

Lectures and conferences concerning techniques of writing for publication. See ENG Notes 1, 2. Prerequisite: ENG 310 or instructor approval.

ENG 413 History of the English Language. (3)*once a year*

Development of English from the earliest times to the modern period. See ENG Notes 1, 2. Prerequisite: junior standing or instructor approval.

*General Studies: HU***ENG 414 Studies in Linguistics. (3)***fall and spring*

Relationship of linguistics to literature, gender, power, and other social issues. May be repeated for credit. See ENG Notes 1, 2. Prerequisite: junior standing.

ENG 415 Medieval Literature. (3)*not regularly offered*

Medieval English literature in translation, from Beowulf to Malory (excluding Chaucer), emphasizing cultural and intellectual backgrounds; includes continental works. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 416 Chaucer: *Canterbury Tales*. (3)***once a year*

Chaucer's language, his last work, and its relationship to continental and insular traditions. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 417 Chaucer: *Troilus and Criseyde* and the Minor Works. (3)***not regularly offered*

Chaucer's language, his major poem, and his early works in their medieval context. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 418 Renaissance Literature. (3)***fall*

Topics, authors, and themes in English literature, 1485–1603. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: L/HU***ENG 419 English Literature in the Early 17th Century. (3)***fall*

Topics, authors, and themes in English literature, 1603–1660. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: L/HU***ENG 421 Shakespeare. (3)***fall and spring*

Selection of comedies, histories, and tragedies. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 422 Studies in Shakespeare. (3)***once a year*

Topics for close examination in selected dramatic and/or nondramatic works. May be repeated for credit when topics vary. See ENG Notes 1, 2, 3. Prerequisite: ENG 421 or instructor approval.

*General Studies: HU***ENG 423 Renaissance Drama. (3)***spring*

Topics, authors, and themes in the drama of the Tudor and early Stuart periods. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: L/HU***ENG 424 Milton. (3)***once a year*

Selected prose and poetry, emphasizing *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 425 Studies in English Romanticism. (3)***fall*

All genres of Romantic literature in cultural contexts, Blake to the death of Wordsworth. May be repeated for credit. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 426 Victorian Poetry. (3)***fall*

Poetry of the second half of the 19th century. May include such poets as Tennyson, Browning, and Arnold. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.

*General Studies: L/HU***ENG 427 Restoration and Early 18th Century. (3)***not regularly offered*

Writers and movements in the nondramatic literature of the Restoration and early 18th century. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 428 The Later 18th Century. (3)***not regularly offered*

Writers, movements, and books during the second half of the 18th century. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 430 Victorian Cultural Backgrounds. (3)***not regularly offered*

Social, religious, and other cultural issues of the period. May include Carlyle, Ruskin, Darwin, Arnold, Pater, and Morris. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.

*General Studies: L/HU***ENG 435 19th-Century American Poetry. (3)***not regularly offered*

Themes and developments in American poetry to 1900, including Poe, Whitman, and Dickinson. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 439 Restoration and 18th-Century Drama. (3)***spring*

English drama 1600–1800. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.

*General Studies: HU***ENG 440 Studies in American Literature to 1815. (3)***not regularly offered*

Thought and expression from the time of first contact to 1815. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or instructor approval.

*General Studies: HU***ENG 441 20th-Century American Drama. (3)***not regularly offered*

American drama since World War I, especially experimental techniques. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.

*General Studies: HU***ENG 442 20th-Century British and Irish Poetry. (3)***not regularly offered*

Theory and practice of poetry since 1900. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.

ENG 443 American Poetry, 1900–1945. (3)*not regularly offered*

Developments in theory and practice of major poets. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.

*General Studies: HU***ENG 444 Studies in American Romanticism, 1830–1860. (3)***fall*

Cultural expression in works of representative writers. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or instructor approval.

*General Studies: HU***ENG 445 Studies in American Realism, 1870–1910. (3)***spring*

Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.

*General Studies: L/HU***ENG 448 20th-Century British and Irish Novel. (3)***not regularly offered*

Theory and practice of the novel since 1900. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.

General Studies: HU

ENG 451 The Novel to Jane Austen. (3)*not regularly offered*

From origins of prose fiction through the 18th century. See ENG Notes 1, 2, 3.

*General Studies: HU, H***ENG 452 The 19th-Century Novel. (3)***spring*

May include such novelists as Austen, Dickens, Eliot, and Conrad.

See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 453 The American Novel to 1900. (3)***not regularly offered*

Rise and development of the novel to Dreiser. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or instructor approval.

*General Studies: HU***ENG 454 The American Novel, 1900–1945. (3)***not regularly offered*

Developments in theory and practice of major novelists. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.

*General Studies: HU***ENG 455 The Form of Verse: Theory and Practice. (3)***not regularly offered*

Types, history, criticism, and schools of theory of metrical form. Analysis of lyric, narrative, and dramatic poetry. See ENG Notes 1, 2.

ENG 457 American Poetry Since 1945. (3)*once a year*

Major American poets of the period. Developments in theory and practice. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or instructor approval.

*General Studies: HU***ENG 458 American Novel Since 1945. (3)***not regularly offered*

Major novelists of the period. Developments in theory and practice. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.

*General Studies: L/HU***ENG 459 Studies in African American/Caribbean Literatures. (3)***not regularly offered*

Studies in African American or Caribbean literatures according to genre, period, theory, or selected authors. May be repeated for credit when topics vary. Cross-listed as AFH 459. Credit is allowed for only AFH 459 or ENG 459. See ENG Notes 1, 2, 3.

ENG 460 Western American Literature. (3)*once a year*

Critical examination of ideas and traditions of the literature of the western United States, including the novel. See ENG Notes 1, 2, 3.

*General Studies: L/HU***ENG 461 Women and Literature. (3)***not regularly offered*

Selected topics in literature by or about women. May be repeated for credit when topics vary. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 462 20th-Century Women Authors. (3)***not regularly offered*

Critical examination of literature by 20th-century women writers. May be repeated for credit when topics vary. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 463 European Drama from Ibsen to 1914. (3)***not regularly offered*

Chief continental and British dramatists of the period, emphasizing the beginnings and development of realism. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 464 European Drama from 1914 to the Present. (3)***not regularly offered*

Chief continental and British dramatists of the period, emphasizing experimental techniques. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 470 Symbols and Archetypes in Children's Literature. (3)***fall*

Various critical approaches and recurring themes studied in relation to classical and contemporary children's literature. Lecture, discussion, reading. See ENG Notes 1, 2, 3.

ENG 471 Literature for Adolescents. (3)*fall and spring*

Prose and poetry that meet the interests and capabilities of junior high and high school students. Recent literature stressed. A passing grade of at least "C" required before students are permitted to student teach in English. See ENG Notes 1, 2, 3.

*General Studies: HU***ENG 472 Rhetorical Studies. (3)***fall and spring*

Developments in theory and practice of major rhetorical inquiries. Seminar, workshop. See ENG Notes 1, 2. Prerequisite: junior standing.

ENG 480 Methods of Teaching English: Composition. (3)*fall or spring and summer*

Methods of instruction, organization, and presentation of appropriate content in the teaching of composition and other writing skills. See ENG Notes 1, 2.

ENG 482 Methods of Teaching English: Language. (3)*fall or spring and summer*

Methods of instruction, organization, and presentation of appropriate content in language and usage for junior and senior high schools. Lecture, discussion, lab. See ENG Notes 1, 2.

ENG 484 Writing Internship. (3–6)*fall and spring*

Students participate in regular internships or service learning internships under the Division of Undergraduate Academic Services or approved Writing Certificate internships. See ENG Notes 1, 2.

ENG 498 Pro-Seminar. (1–7)*fall and spring*

See ENG Notes 1, 2. Possible topics:

(a) Portfolio. (1)

ENG 500 Research Methods. (3)*once a year*

Methodology and resource materials for research. Analysis of criticism and scholarship, including evaluation of sources.

ENG 501 Introduction to Comparative Literature. (3)*not regularly offered*

Problems, methods, and principles, illustrated by selected critical essays and literary texts.

ENG 502 Contemporary Critical Theory. (3)*once a year*

Advanced survey of major schools of 20th-century literary and critical theory. Lecture, discussion. Cross-listed as HUM 549. Credit is allowed for only ENG 502 or HUM 549.

ENG 507 Old English. (3)*not regularly offered*

Elements of Old English grammar, with selected readings.

ENG 508 Old English Literature. (3)*not regularly offered*

Intensive literary, linguistic, and cultural study of Old English literature. May be repeated for credit when topics vary. Prerequisite: ENG 507.

ENG 509 Middle English. (3)*not regularly offered*

Study of the principal dialects of the language, with selected readings. Prerequisite: graduate standing.

ENG 512 The Teaching of Composition. (3)*not regularly offered*

Theory and practice of teaching writing at all levels. Emphasis on current research. Prerequisites: teaching experience; instructor approval.

ENG 515 Middle English Literature. (3)*not regularly offered*

English literature from the 12th through the 15th centuries, exclusive of Chaucer. Prerequisite: ENG 509 or instructor approval.

ENG 517 Contemporary Rhetorical Theory. (3)*once a year*

Investigation of the work of such important rhetorical theorists as Burke, Toulmin, Perelman, Gates, and Cixous.

ENG 520 Renaissance Literature. (3)*not regularly offered*

Poetry and prose of the English Renaissance, excluding drama.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ENG 521 Shakespeare. (3)*once a year*

Selection of comedies, histories, and tragedies presented in the context of literary history and critical theories, with an emphasis on classical and medieval backgrounds.

ENG 525 American Literary Criticism. (3)*not regularly offered*

Analysis and discussion of leading historical and critical interpretations of American literature from the beginnings to the present.

ENG 530 Classical Rhetoric and Written Composition. (3)*fall*

Relationship of major texts in classical rhetoric to developments in composition theory, literary theory, and practice through the 19th century.

ENG 531 Rhetorical Theory and Literary Criticism. (3)*spring*

Intensive study of major rhetorical theorists of the 20th century in such areas as literary criticism, discourse theory, and composition theory.

ENG 532 Composition Theory. (3)*not regularly offered*

Intensive study in the rhetorical categories of invention, arrangement, style, aims, modes, and forms of written discourse.

ENG 545 Studies in English Literature. (3)*not regularly offered*

Selected authors or issues. May be repeated for credit.

ENG 547 Studies in American Literature. (3)*not regularly offered*

Selected authors or issues. May be repeated for credit.

ENG 549 Studies in Comparative Literature. (3)*not regularly offered*

Selected authors or issues. May be repeated for credit.

ENG 550 Contemporary Comparative Literature. (3)*not regularly offered*

Comparative studies in modern literature in English and other literatures in translation. May be repeated for credit when topics vary.

ENG 559 Advanced Study in African American/Caribbean Literatures. (3)*not regularly offered*

Advanced study in African American or Caribbean literatures, theory, and criticism. May be repeated for credit when topics vary.

ENG 560 Studies in Dramatic Forms. (3)*not regularly offered*

Selected topics in dramatic and cinematic literature, history, criticism, theory, and crossdisciplinary study. May be repeated for credit when topics vary. Lecture, studio.

ENG 571 Advanced Study in Literature for Adolescents. (3)*not regularly offered*

History and criticism of adolescent literature. Prerequisite: ENG 471 or instructor approval.

ENG 573 Censorship and Literature. (3)*not regularly offered*

History of censorship, primarily in the United States, and significant court decisions that affected writers and books.

ENG 580 Practicum. (1–12)*not regularly offered***ENG 591 Seminar. (3)***fall and spring*

Selected topics regularly offered in the various areas of English studies.

ENG 594 Conference and Workshop. (1–12)*not regularly offered***ENG 598 Special Topics. (1–4)***not regularly offered***ENG 599 Thesis. (1–12)***not regularly offered***LINGUISTICS (LIN)**

See the *Graduate Catalog* for the LIN courses.

WRITING ACROSS THE CURRICULUM (WAC)**WAC 101 Introduction to Academic Writing. (3)***fall and spring*

Combines classroom and supplemental instruction to teach academic genres of writing, including definition, summary, and analysis.

WAC 107 Introduction to Academic Writing for International Students. (3)*fall and spring*

For students from non-English-speaking countries. Combines classroom and supplemental instruction with intensive reading, writing, and discussion.

Department of Exercise Science and Physical Education

Philip E. Martin

Chair

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REGENTS' PROFESSOR

LANDERS

PROFESSORS

BURKETT, DARST, KRAHENBUHL, MARTIN,
PANGRAZI, STELMACH

ASSOCIATE PROFESSORS

HINRICHS, MATT, MORGAN, PAGLIASOTTI,
TREASURE, WILLIS

ASSISTANT PROFESSORS

ETNIER, GERRITSEN, ROBERTSON, SANTELLO

SENIOR LECTURER

LANDERS

LECTURER

PRIDE

**EXERCISE SCIENCE/PHYSICAL EDUCATION—
B.S.**

The B.S. degree in Exercise Science/Physical Education consists of 42 semester hours, including 21 semester hours of required EPE core courses (EPE 110 may be repeated for credit). The remaining 21 semester hours of EPE and other courses are prescribed by the specific concentration the student selects.

The required EPE core courses are as follows:

EPE 110	Movement Analysis Laboratory	6
EPE 200	Introduction to Exercise Science and Physical Education	3
EPE 335	Biomechanics	3
EPE 340	Physiology of Exercise	3
EPE 345	Motor and Developmental Learning	3
EPE 352	Psychosocial Aspects of Physical Activity.....	3
Total	.....	21

Each EPE core course has specific prerequisite courses that must be taken before taking the respective core course. These prerequisite courses include the following:

BIO 201	Human Anatomy and Physiology I SG	4
BIO 202	Human Anatomy and Physiology II.....	4

CHM 101 Introductory Chemistry <i>SQ</i>	4
MAT 117 College Algebra <i>MA</i>	3
PGS 101 Introduction to Psychology <i>SB</i>	3
PHY 111 General Physics <i>SQ*</i>	3
Total	21

* Both PHY 111 and 113 must be taken to secure *SQ* credit.

All prerequisite and EPE courses must be completed with a minimum grade of "C." The requirements for the specific concentrations are described below.

Majors must elect either the exercise science or physical education concentration.

Exercise Science Concentration. Candidates for the exercise science concentration must complete 21 semester hours beyond the core courses in the major field, at least 12 of which must carry EPE prefixes, be upper-division courses, and concern the theoretical subjects of the core. The remaining nine semester hours may carry either EPE prefixes or prefixes from related disciplines selected with the advice and consent of a faculty advisor. Activity courses may not be used to fulfill part of the 21 semester hour requirement. No more than six semester hours may be in independent study courses.

Physical Education Concentration. Candidates must complete 21 semester hours beyond the EPE core courses, 12 of which must carry EPE prefixes from the required course list below.

EPE 361 Physical Education in the Secondary School.....	3
EPE 376 Physical Education for the Elementary School.....	3
EPE 382 Physical Education for the Atypical Student	3
EPE elective*	3
Total	12

* See advisor for approved electives.

The remaining nine semester hours of related course work can carry either EPE, psychology, special education, child development, and/or education prefixes. Activity courses (EPE 110) may be used to fulfill part of the 21-semester-hour requirement (additional four semester hours maximum). No more than six semester hours may be taken in internship. Internship experiences may only be in elementary and secondary school teaching and coaching settings. A maximum of six semester hours may be in independent study.

EXERCISE SCIENCE/PHYSICAL EDUCATION MINOR

The minor in Exercise Science/Physical Education consists of the core sequence in exercise science and physical education as follows, plus all prerequisite courses:

EPE 110 Movement Analysis Laboratory	6
EPE 200 Introduction to Exercise Science and Physical Education	3
EPE 335 Biomechanics	3
EPE 340 Physiology of Exercise	3
EPE 345 Motor and Developmental Learning	3

EPE 352 Psychosocial Aspects of Physical Activity.....	3
Total	21

SECONDARY EDUCATION—B.A.E.

Physical Education. Candidates for the B.A.E. degree are required to complete the following courses in physical education in addition to the required EPE core courses:

EPE 361 Physical Education in the Secondary School.....	3
EPE 376 Physical Education for the Elementary School.....	3
EPE 382 Physical Education for the Atypical Student	3
EPE 480 Methods of Teaching Physical Education.....	3
EPE elective*	3
Total	15

* See an advisor for approved electives.

Students must also complete a four-semester Physical Education Teacher Preparation Program professional sequence in the College of Education (38 semester hours). Entry into this degree program requires filing an application, passing scores on a Pre-Professional Skills Test (PPST) or American College Test (ACT), 56 semester hours of completed university study, and a minimum GPA of 2.50. See "College of Education," page 178, for additional requirements.

GRADUATE PROGRAMS

The faculty in the Department of Exercise Science and Physical Education offer programs leading to the Master of Physical Education degree and the M.S. degree in Exercise Science/Physical Education. The department also participates with the Graduate College in the program leading to the Ph.D. degree in Exercise Science and with the College of Education and the Graduate College in the program leading to the Ph.D. degree in Curriculum and Instruction with a concentration in physical education. See the *Graduate Catalog* for requirements.

EXERCISE SCIENCE/PHYSICAL EDUCATION (EPE)

EPE Note 1. A \$5.00 towel and locker fee is required each semester by students using towel and locker facilities for physical education classes and intramural activities.

EPE Note 2. Physical education activity classes (EPE 105, 205, 305, 310) may not be taken for audit. Excessive absences and/or tardiness are considered disruptive behavior.

EPE 100 Introduction to Health and Wellness. (3)

fall, spring, summer

Current concepts in health, exercise, and wellness. Emphasis placed on personal health, theories, attitudes, beliefs, and behaviors. Cross-listed as EXW 100/HES 100. Credit is allowed only for EPE 100 or EXW 100 or HES 100.

General Studies: SB

EPE 105 Physical Education Activity. (1)

fall, spring, summer

Beginning instruction in a wide variety of sports such as aerobics, aquatics, racquet sports, physical conditioning, and golf. 3 hours per week. "Y" grade only. May be repeated for credit. Fee. See EPE Notes 1, 2.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

EPE 110 Movement Analysis Laboratory. (1–2)*fall, spring, summer*

Practical application of biomechanical, physiological, psychological, and learning principles in the analysis of skill acquisition and performance. May be repeated for credit. Fee. See EPE Note 1. Prerequisites: EPE 105 proficiency; ESPE major.

EPE 191 First-Year Seminar. (1–3)*fall and spring***EPE 200 Introduction to Exercise Science and Physical Education. (3)***fall, spring, summer*

Introduction to the disciplines and professions associated with ESPE, including an overview of historical and philosophical foundations.

EPE 205 Physical Education Activity. (1)*fall, spring, summer*

Intermediate levels. Continuation of EPE 105. 3 hours per week. May be repeated for credit. Fee. See EPE Notes 1, 2.

EPE 283 Prevention and Care of Athletic Injuries. (3)*fall*

Taping, injury recognition, emergency care, and observation procedures in athletic training. Prerequisites: BIO 201, 202.

EPE 290 Sports Officiating. (3)*fall*

Rules and mechanics of officiating used in football, basketball, and volleyball.

EPE 292 Sports Officiating. (3)*spring*

Rules and mechanics of officiating used in softball (slow and fast pitch), baseball, and track and field.

EPE 305 Physical Education Activity. (1)*fall, spring, summer*

Advanced levels. Continuation of EPE 205, with instructor's approval. 3 hours per week. May be repeated for credit. Fee. See EPE Notes 1, 2.

EPE 310 Collegiate Sports. (1)*fall and spring*

Participation in men's or women's intercollegiate competition. May be repeated for 4 credits, 1 per year. "Y/E" grade.

EPE 334 Functional Anatomy and Kinesiology. (3)*spring*

Muscles, bones, joints, and nerves and how they produce movement. Emphasis on muscle origins, insertions, actions, and innervations. Lecture, lab. Prerequisite: BIO 201.

EPE 335 Biomechanics. (3)*fall, spring, summer*

Basic anatomical and mechanical principles applied to human movement. Emphasis placed on kinematic and kinetic concepts. Lecture, recitation, lab. Fee. Prerequisites: BIO 201; MAT 117; PHY 111.

EPE 340 Physiology of Exercise. (3)*fall, spring, summer*

Physiological mechanisms of acute responses and chronic adaptations to exercise. Lecture, recitation, lab. Fee. Prerequisites: BIO 201, 202; CHM 101.

EPE 345 Motor and Developmental Learning. (3)*fall, spring, summer*

Principles of motor skill acquisition across the life span, focusing on the learner and the learning environment. Lecture, recitation, lab. Fee. Prerequisites: BIO 201; PGS 101.

EPE 348 Psychological Skills for Optimal Performance. (3)*fall, spring, summer*

Applies psychological techniques and their use to improve effectiveness and performance in sport and related areas.

*General Studies: SB***EPE 352 Psychosocial Aspects of Physical Activity. (3)***fall, spring, summer*

Interrelationships between physical activity and psychosocial variables, including socialization, cultural values, aggression, and motivation. Includes the psychological benefits of physical activity and exercise adherence. Lecture, recitation. Prerequisite: PGS 101.

*General Studies: SB, C***EPE 361 Physical Education in the Secondary School. (3)***fall and spring*

Current trends and theories, such as elective programs, coed classes, legal issues, contract teaching, curriculum, and administration.

EPE 370 Advanced First Aid. (3)*not regularly offered*

Assessment, management, treatment of wounds, injuries, shock, poisoning, burns, sudden illness, emergency rescue, and cardiopulmonary resuscitation. Lecture, lab. Fee.

EPE 376 Physical Education for the Elementary School. (3)*fall and spring*

Scope and values of physical education in the elementary school. Methods, materials, and practice in teaching activities for primary, intermediate, and upper grades.

EPE 382 Physical Education for the Atypical Student. (3)*fall and spring*

Teaching individuals with handicapping conditions physical skills and activities. Prerequisites: BIO 201, 202.

EPE 412 Biomechanics of the Skeletal System. (3)*fall*

Biomechanics of tissues, structures, and major joints of the musculoskeletal system. Discussion of injury mechanisms. Lecture, discussion, some labs. Prerequisite: EPE 335 or instructor approval.

EPE 413 Qualitative Analysis in Sport Biomechanics. (3)*spring*

Develops systematic approach for detecting and correcting errors in human performance using anatomical and mechanical principles. Lecture, lab. Prerequisite: EPE 335.

EPE 414 Electromyographic Kinesiology. (3)*fall*

Muscular contributions to human movement, muscle mechanics, electrophysiological basis, and practical application of electromyography. Lecture, discussion. Prerequisites: EPE 335, 340; instructor approval.

*General Studies: L***EPE 440 Exercise Biochemistry. (3)***fall*

Study of bioenergetics and metabolism of cellular (skeletal muscle, heart, and liver) organelles and proteins during exercise. Prerequisite: EPE 340.

EPE 441 Physiology of Women in Sport. (3)*spring*

Physiological aspects of women engaging in physical activity. Emphasizes factors affecting performance and health throughout life. Prerequisite: EPE 340.

*General Studies: L***EPE 443 Exercise Endocrinology. (3)***spring*

Discussions of current research and theory concerning hormonal changes during exercise. Lecture, discussion. Prerequisite: EPE 340 or instructor approval.

*General Studies: L***EPE 444 Metabolic Adaptations to Exercise Training. (3)***fall, spring, summer*

Examines physiologic adaptations to exercise training as they relate to metabolism and tissue functions. Prerequisite: EPE 340.

EPE 448 Applied Sport Psychology. (3)*spring*

Psychological theories and techniques applied to a sport to enhance the performance and personal growth of athletes and coaches. Lecture, discussion. Prerequisite: EPE 352 (or its equivalent).

*General Studies: L***EPE 452 Exercise Psychology. (3)***spring*

Contemporary research and theory as related to human behavior and health in an exercise setting. Prerequisite: EPE 352.

*General Studies: SB***EPE 460 Theory of Strength Training. (3)***spring*

Research and theories on developing muscular strength; programs for developing muscular strength. Lecture, discussion. Prerequisites: EPE 335, 340.

*General Studies: L***EPE 478 Student Teaching in Secondary Schools. (3–12)***fall and spring*

Practice of teaching. Relationship of practice and theory in teaching. Prerequisite: two complete semesters of block (or its equivalent).

EPE 480 Methods of Teaching Physical Education. (3)*fall and spring*

Methods of instruction, organization, and presentation of appropriate content in elementary and secondary physical education. Concurrent with student teaching or instructor approval. Prerequisites: EPE 361, 376.

EPE 484 Internship. (6)*not regularly offered***EPE 485 Advanced Techniques of Athletic Training. (3)***spring*

Advanced course in athletic training designed for students seeking NATA certification. Emphasis on therapeutic modalities and rehabilitation procedures. Prerequisites: EPE 283, 370; CPR certification.

EPE 500 Research Methods. (3)*fall*

Introduction to the basic aspects of research, including problem selection, literature review, instrumentation, data handling, methodology, and the writing of research reports and articles.

EPE 501 Research Statistics. (3)*spring*

Statistical procedures; sampling techniques; exercise testing, exercise prescription, hypothesis testing, and experimental designs as they relate to research publications. Prerequisite: EPE 340.

EPE 505 Applied Exercise Physiology Techniques. (3)*fall*

Investigative techniques used in the applied exercise physiology laboratory. Emphasis on pulmonary function, body composition, and cardiorespiratory assessment. Lecture, lab. Fee. Prerequisite: EPE 340.

EPE 510 Introduction to Biomechanics Research Methods. (3)*fall*

Application of mechanics to human movement analysis. Includes consideration of two-dimensional imaging techniques, force measurement, electromyography, and data processing methods. Lecture, discussion, some labs. Prerequisite: EPE 335 or instructor approval.

EPE 520 Sport Psychology. (3)*fall*

Current research in sport psychology with an emphasis on performance enhancement. Includes questionnaire, psychophysiological, and behavioral research methods. Lecture, discussion. Prerequisites: EPE 448, 500.

EPE 521 Motor Development, Control, and Learning. (4)*spring*

Theory and research on motor skill acquisition, including learning/control and development (i.e., growth, children and exercise, and development learning). Lecture, discussion, some labs. Prerequisites: EPE 345, 500, 501.

EPE 522 Exercise Psychology. (3)*spring*

Contemporary research and theory as related to human behavior and health in an exercise setting. Lecture, discussion. Prerequisite: EPE 500.

EPE 530 Exercise Physiology. (3)*fall*

Immediate and long-term adaptations to exercise with special reference to training and the role of exercise in cardiovascular health. Prerequisite: EPE 340.

EPE 531 Physiology of Women in Sport. (3)*spring*

Physiological aspects of women engaging in physical activity. Emphasizes factors affecting performance and health throughout life. Prerequisite: EPE 340.

EPE 561 Administration of Athletics. (3)*not regularly offered*

Managing an athletic program, including financing, budget policies, staging, and promotion of athletic contests, schedules, travel insurance, and current athletic trends.

EPE 570 Programs and Special Topics in Adapted Physical Education. (3)*fall*

Contemporary adapted, developmental, remedial, and corrective physical education programs; understanding of principles, problems, and recent developments in this area.

EPE 572 Trends and Issues in Physical Education. (3)*spring*

Literature, research, and practices in contemporary physical education, including finances, Title IX, teaching and coaching philosophies, school organization, and nonteaching physical education programs.

EPE 573 Curriculum and Instruction in Secondary Physical Education. (3)*fall*

Current curriculum and instruction practices and research in secondary school physical education. Prerequisite: ESPE major or teaching experience.

EPE 574 Analysis of Teaching Behavior in Sport and Physical Education. (3)*not regularly offered*

Use of systematic, direct observation techniques in analyzing and evaluating instruction in sport and physical education. Lecture, lab.

EPE 576 Physical Education for Elementary School Children. (3)*fall*

Current practices and research pertaining to elementary school physical education programs.

EPE 578 Student Teaching in Secondary Schools. (6–12)*fall and spring*

Practice of teaching. Relationship of theory and practice in teaching. Prerequisite: completion of all required course work (or its equivalent) prior to student teaching.

EPE 599 Thesis. (1–12)*not regularly offered***EPE 610 Advanced Topics in Biomechanics. (3)***spring*

Three-dimensional imaging techniques, data analysis theory, and integration of biomechanics research tools; includes original research project. Lecture, discussion, some labs. Prerequisite: EPE 510 or instructor approval.

EPE 620 Developmental Motor Skill Acquisition. (3)*spring in odd years*

Cognitive-motor theories of learning/performance applied to children's motor skill acquisition. Study of knowledge development and research analysis/techniques. Lecture, discussion. Prerequisite: EPE 521.

EPE 621 Motor Learning/Control. (3)*fall*

Discussion of contemporary research issues in motor learning and control. Includes behavioral and neurophysiological issues. Lecture, discussion. Prerequisite: EPE 521.

HEALTH SCIENCE (HES)**HES 100 Introduction to Health and Wellness. (3)***fall, spring, summer*

Current concepts in health, exercise, and wellness. Emphasis placed on personal health, theories, attitudes, beliefs, and behaviors. Cross-listed as EPE 100/EXW 100. Credit is allowed for only EPE 100 or EXW 100 or HES 100.

General Studies: SB

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Department of Family and Human Development

Richard Fabes
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PROFESSORS

CHRISTOPHER, FABES, GRIFFIN, HOOVER,
MARTIN, ROOSA

ASSOCIATE PROFESSORS

BOULIN JOHNSON, DUMKA, WILSON

ASSISTANT PROFESSORS

ESTRADA, FROSCHE, HANISH, MADDEN-DERDICH,
SPINRAD, UPDEGRAFF

SENIOR LECTURER

WEIGAND

LECTURER

BODMAN

FAMILY AND HUMAN DEVELOPMENT—B.S.

For the B.S. degree in Family and Human Development at ASU Main, students must pursue the concentration in family studies/child development.

Family Studies/Child Development

The concentration in family studies/child development consists of the following core courses:

CDE 232 Human Development <i>SB</i>	3
CDE 430 Infant/Toddler Development in the Family <i>SB</i>	3
CDE 498 Pro-Seminar	6
or FAS 498 Pro-Seminar (6)	
FAS 331 Marriage and Family Relationships <i>SB</i>	3
FAS 361 Introduction to Family/Child Research Methods <i>L</i>	3
FAS 370 Family Ethnic and Cultural Diversity <i>SB, C</i>	3
FAS 431 Parent-Adolescent Relationships <i>SB</i>	3
FAS 435 Advanced Marriage and Family Relationships <i>L/SB</i>	3
FAS 440 Fundamentals of Marriage and Family Therapy	3
Total	30

In addition, 12 hours of electives must be taken from the following:

CDE 337 Early Childhood Intervention	3
CDE 338 Child Development Practicum	2-4
CDE 437 Observational and Naturalistic Methods of Studying Children <i>L/SB</i>	3
CDE 444 Children and Poverty	3
CDE 498 Pro-Seminar	3
or FAS 498 Pro-Seminar (3)	
or FAS 499 Individualized Instruction (3)	
FAS 330 Personal Growth in Human Relationships <i>SB</i>	3
FAS 332 Human Sexuality <i>SB</i>	3
FAS 390 Supervised Research Experience	1-3
FAS 432 Family Development	3
FAS 436 Conceptual Frameworks in Family Studies	3
FAS 484 Internship	1-3

FAMILY AND HUMAN DEVELOPMENT MINOR

The minor in Family and Human Development consists of 18 semester hours in which students specialize in family studies/child development.

At least 12 of the 18 hours must be in upper-division courses.

Students take the following courses:

CDE 232 Human Development <i>SB</i>	3
CDE 337 Early Childhood Intervention	3
FAS 331 Marriage and Family Relationships <i>SB</i>	3
FAS 440 Fundamentals of Marriage and Family Therapy	3
Total	12

Two courses (or six semester hours) must be selected from the following:

CDE 430 Infant/Toddler Development in the Family <i>SB</i>	3
CDE 444 Children and Poverty	3
CDE 498 Pro-Seminar	3
or FAS 498 Pro-Seminar (3)	
FAS 370 Family Ethnic and Cultural Diversity <i>SB, C</i>	3
FAS 431 Parent-Adolescent Relationships <i>SB</i>	3

SECONDARY EDUCATION—B.A.E.

Family and Human Development (Home Economics).

The major teaching field consists of 42 semester hours in family and human development and six hours in interior design. Major courses required are as follows:

CDE 232 Human Development <i>SB</i>	3
CDE 337 Early Childhood Intervention	3
FAS 330 Personal Growth in Human Relationships <i>SB</i>	3
FAS 331 Marriage and Family Relationships <i>SB</i>	3
FAS 431 Parent-Adolescent Relationships <i>SB</i>	3
FRD 451 Field Experience	1-12
HEE 461 Presentations in Home Economics	3
HEE 480 Methods of Teaching Home Economics	3-4
HEE 481 Teaching Occupational Home Economics	3
NTR 100 Introductory Nutrition	3
NTR 142 Applied Food Principles	3
Total	31-43

Also required are two interior design courses.

The College of Education has additional requirements for teacher certification: Arizona Teacher Proficiency Exam (professional knowledge only); 35 hours within the Professional Teacher Preparation Program; and the following courses:

POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 311 Arizona Constitution and Government	2
or POS 417 The Arizona Political System <i>SB</i> (3)	

Applications to this program are not being accepted at this time.

GRADUATE PROGRAMS

The faculty in the Department of Family and Human Development offer programs leading to the M.S. and Ph.D. degrees. See the *Graduate Catalog* for requirements.

CHILD DEVELOPMENT (CDE)**CDE 232 Human Development. (3)***fall, spring, summer*

Lifespan development from conception through adulthood, with emphasis on family influences. Recognition of individuality within the universal pattern of development. Prerequisites: PGS 101; SOC 101.

*General Studies: SB***CDE 337 Early Childhood Intervention. (3)***fall*

Explores how child development theory affects practice with children and families, emphasizing development of young children and early intervention. Prerequisite: CDE 232 (or its equivalent).

CDE 338 Child Development Practicum. (2–4)*fall and spring*

Supervised practicum in the Child Development Lab preparing students for work in child care centers and agencies serving young children and families. Lab. Pre- or corequisite: CDE 337.

CDE 430 Infant/Toddler Development in the Family. (3)*fall and spring*

Examination of the development of infants/toddlers, the socialization processes of families, and the interactions of these processes. Prerequisite: CDE 232 (or its equivalent).

*General Studies: SB***CDE 437 Observational and Naturalistic Methods of Studying Children. (3)***not regularly offered*

In-depth examination of implementing observational and naturalistic studies of children in a variety of settings. 2 hours lecture, 3 hours lab. Prerequisites: CDE 430; 6 hours in psychology.

*General Studies: L/SB***CDE 444 Children and Poverty. (3)***fall*

Impact that poverty has on children and their families. 2 hours lecture, 3 hours lab. Prerequisites: CDE 232 (or its equivalent); 6 hours in upper-division social sciences.

CDE 498 Pro-Seminar. (3)*not regularly offered***CDE 499 Individualized Instruction. (3)***not regularly offered***CDE 531 Theoretical Issues in Child Development. (3)***spring*

Major developmental theories, related research, and their application to family interaction. Prerequisites: both CDE 430 and 437 (or their equivalents) or only instructor approval.

CDE 533 Research Issues in Child Development. (3)*spring*

In-depth exploration and critique of research focusing on child development in a family setting. Prerequisites: CDE 531; FAS 500.

CDE 534 Applied Child Development. (3)*spring*

Integration of research and theory on child development, risk, and resilience to understand developmental problems and provide a foundation for intervention strategies. Prerequisites: CDE 531; FAS 500.

CDE 634 Advanced Applied Child Development. (3)*spring*

Advanced training in research and theory-based approaches to developing and evaluating prevention programs for children at risk. Prerequisite: CDE 534 or instructor approval.

FAMILY STUDIES (FAS)**FAS 301 Introduction to Parenting. (3)***fall and spring*

Integrated approach to understanding parenting and parent-child interactions. Television course. Prerequisites: PGS 101; SOC 101 (or its equivalent).

FAS 330 Personal Growth in Human Relationships. (3)*fall, spring, summer*

Personal development and behavior as related to competency in interpersonal relationships within the family. Processes of family interaction. Prerequisites: PGS 101; SOC 101 (or its equivalent).

*General Studies: SB***FAS 331 Marriage and Family Relationships. (3)***fall, spring, summer*

Issues, challenges, and opportunities relating to present-day marriage and family living. Factors influencing interrelations within the family. Prerequisite: course in psychology or sociology.

*General Studies: SB***FAS 332 Human Sexuality. (3)***fall and spring*

Relationship of sexuality to family life and to major societal issues. Emphasis on developing healthy, positive, and responsive ways of integrating sexual and other aspects of human living. Prerequisite: PGS 101.

*General Studies: SB***FAS 361 Introduction to Family/Child Research Methods. (3)***fall and spring*

Examines basic methods applied to family/child research, critiques current research literature, and applies methods in current topics. Prerequisites: CDE 232; FAS 331.

*General Studies: L***FAS 370 Family, Ethnic, and Cultural Diversity. (3)***fall and spring*

Integrative approach to understanding historical and current issues related to the structure and internal dynamics of diverse American families. Lecture, discussion. Cross-listed as AFS 370. Credit is allowed for only AFS 370 or FAS 370. Prerequisite: PGS 101 or SOC 101.

*General Studies: SB, C***FAS 390 Supervised Research Experience. (1–3)***fall, spring, summer*

Practical, firsthand experience within current faculty research projects in family studies or child development. "Y" grade only; may be repeated for total of 6 hours. Prerequisites: FAS 361; 3.00 GPA in major; approval of supervising faculty member before registration.

FAS 431 Parent-Adolescent Relationships. (3)*fall*

Dynamics of the relationships between parents and adolescents. Developmental characteristics of adolescence and the corresponding adult stage. Prerequisites: CDE 232; FAS 331.

*General Studies: SB***FAS 432 Family Development. (3)***not regularly offered*

Normative changes in families over time from formation until dissolution. Emphasis on the marital subsystem in middle and later years. Prerequisites: both CDE 232 and FAS 331 or only instructor approval.

FAS 435 Advanced Marriage and Family Relationships. (3)*fall and spring*

Recent research, issues, and trends relating to marriage and family interaction. Influence of family composition, physical environment, family patterns, and values on family dynamics. Prerequisites: FAS 331, 361.

*General Studies: L/SB***FAS 436 Conceptual Frameworks in Family Studies. (3)***spring*

Approaches to study families focusing on systems, interactional, exchange, conflict, and developmental frameworks. Applications to diverse individual and family situations. Prerequisites: CDE 232; FAS 331, 361.

FAS 440 Fundamentals of Marriage and Family Therapy. (3)*fall and spring*

Introduction to the fundamental orientations of marriage and family therapy.

FAS 484 Internship. (1–3)*fall and spring***FAS 498 Pro-Seminar. (3)***fall and spring*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

FAS 499 Individualized Instruction. (3)*fall and spring***FAS 500 Research Methods. (4)***fall*

Purposes of research. Experimental design, methods of data collection, and thesis proposal development. Includes practical application research laboratory. 3 hours lecture, 3 hours lab.

FAS 530 Introduction to Marriage and Family Therapy. (3)*fall*

Introduction of major marriage and family therapy orientations. Review history, theory, application, and outcome research for each orientation. Prerequisite: admission to graduate program in FRHD with a concentration in family studies or instructor approval.

FAS 531 Family Theory Development. (3)*spring*

Historical and current approaches to theory development, evaluation, and application in family studies. Prerequisite: FAS 435 or instructor approval.

FAS 536 Dysfunctional Marriage and Family Relationships. (3)*not regularly offered*

Critical review of current theory and empirical evidence connecting marital and family interaction patterns with aberrant behavior. Prerequisite: PGS 466 or PSY 573 (or its equivalent) or instructor approval.

FAS 537 Interpersonal Relationships. (3)*fall*

Critical examination of current theoretical and research developments in the area of interpersonal relationships. Emphasizes applications for research and intervention. Prerequisite: FAS 435 (or its equivalent) or instructor approval.

FAS 538 Advanced Techniques in Marriage and Family Therapy. (3)*not regularly offered*

In-depth review of assumptions and advanced techniques associated with contemporary marriage and family therapy approaches. Prerequisite: a graduate-level course in marriage and family therapy or instructor approval.

FAS 539 Research Issues in Family Interaction. (3)*fall*

Critical review of current and past research in the area of family dynamics. Emphasizes interactional processes within the family. Prerequisite: FAS 435 (or its equivalent) or instructor approval.

FAS 540 Assessment in Marriage and Family Therapy. (3)*spring*

Assessment and outcome evaluation of couples and families involved in marital and family therapy. Lecture, lab. Prerequisites: FAS 500 (or its equivalent); PSY 530; instructor approval.

FAS 580 Marriage and Family Therapy Practicum. (1–12)*fall and spring*

Supervised clinical experience in marriage and family therapy; includes development of assessment and outcome evaluation skills. Lecture, lab. Possible topics:

- (a) First semester. (3)
- (b) Second semester. (3)
- (c) Third semester. (3)

Prerequisite: instructor approval.

FAMILY AND HUMAN DEVELOPMENT (FRD)**FRD 451 Field Experience. (1–12)***not regularly offered*

Supervised field placement in the area of student's concentration with a community business or agency. Students must make arrangements with instructor 1 semester in advance of enrollment. Prerequisites: completion of 60 hours; instructor approval.

HOME ECONOMICS EDUCATION (HEE)**HEE 461 Presentations in Home Economics. (3)***not regularly offered*

Presentation and demonstration techniques in teaching home economics. Development of audiovisual materials for home economics content areas. Prerequisites: junior standing; instructor approval.

HEE 480 Methods of Teaching Home Economics. (3–4)*not regularly offered*

Instruction, organization, presentation, and evaluation of subject matter in home economics. HEE students register for 4 semester hours. Dietetic students register for 3 semester hours.

HEE 481 Teaching Occupational Home Economics. (3)*not regularly offered*

Career orientation related to home economics, cooperative work-related instruction, programs, and youth club advisement associated with secondary home economics programs. May include field trips. Prerequisite: Family and Human Development major or minor.

Department of Geography**Breandán Ó hUallacháin***Chair***(SCOB 330) 480/965-7533****geography.asu.edu**

PROFESSORS

ARREOLA, BALLING, BRAZEL, BURNS, CERVENY,
COMEAX, DORN, GOBER, Ó HUALLACHÁIN,
PASQUALETTI, ZEHNDER

ASSOCIATE PROFESSORS

FALL, KUBY, MCHUGH

ASSISTANT PROFESSORS

EDSALL, ELLIS, SIERRA-MALDONADO, WENTZ

Geography is a discipline that brings together the physical and human dimensions of the world in the study of places, people, and environments. The mission of the Department of Geography is the creation, dissemination, and application of geographic knowledge and scholarship in a liberal arts and sciences tradition.

Undergraduate students may choose to pursue a B.A. degree in Geography, B.S. degree in Geography, B.A.E. degree in Secondary Education, or minor in Geography. A grade of "C" or higher is necessary in all required Department of Geography courses. Both B.A. and B.S. degrees in Geography consist of a minimum of 45 semester hours. A minor consists of 18 semester hours.

GEOGRAPHY—B.A.

A student choosing a B.A. degree in Geography may be interested in a liberal arts and sciences focus on the breadth of the field. A B.A. degree may also focus on a geographic region. In either case, the student crafts an individualized program of study in consultation with an advisor.

The B.A. degree consists of courses in core geographic knowledge (10–11 semester hours), geographic skills (12 hours), a regional course (three hours), and electives (12 hours), for a minimum of 37 hours in geography. At least 18 hours in geography must be in upper-division courses. The remaining nine hours are made up of electives from geography courses or related fields of study, chosen in consultation with an advisor.

Core Geographic Knowledge

GCU 102 Introduction to Human Geography <i>SB</i>	3
GCU 121 World Geography <i>SB, G</i>	4
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or GPH 411 Physical Geography (3)	

Total10–11

Core Geographic Skills

GCU 495 Quantitative Methods in Geography <i>CS</i>	3
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GCU 496 Geographic Research Methods <i>L</i>	3
GPH 371 Cartography <i>CS</i>	3
GPH 491 Geographic Field Methods.....	3
Total	12

Geographic Region

Choose one of the courses below, in consultation with an advisor.....	3
GCU 322 Geography of U.S. and Canada <i>SB, C</i> (3)	
GCU 323 Geography of Latin America <i>SB, G</i> (3)	
GCU 325 Geography of Europe <i>SB, G</i> (3)	
GCU 326 Geography of Asia <i>SB, G</i> (3)	
GCU 327 Geography of Africa <i>SB, G</i> (3)	
GCU 328 Geography of Middle East and North Africa <i>SB, G</i> (3)	
GCU 332 Geography of Australia and Oceania <i>SB, G</i> (3)	
GCU 344 Geography of Hispanic Americans <i>SB, C</i> (3)	
GCU 421 Geography of Arizona and Southwestern United States <i>SB, C</i> (3)	
GCU 423 Geography of South America <i>SB, G</i> (3)	
GCU 424 Geography of Mexico and Middle America <i>SB, G</i> (3)	
GCU 425 Geography of the Mexican American Borderland <i>L/SB, G</i> (3)	
GCU 426 Geography of Russia and Surroundings <i>SB, G</i> (3)	
GCU 433 Geography of Southeast Asia (3)	
GPH 433 Alpine and Arctic Environments <i>G</i> (3)	

A student can design, in consultation with an advisor, a general B.A. degree in Geography. In addition, there are three cooperative programs whereby a student receives a B.A. degree in Geography and an emphasis in Asian Studies, Southeast Asian Studies, or Latin American Studies.

Asian and Southeast Asian Emphasis. Students majoring in Geography may elect to pursue an Asian or Southeast Asian emphasis combining courses from the major with selected courses of wholly Asian or Southeast Asian content. The Asian program requires 30 semester hours of Asian content courses, selected from the list drawn up by the Center for Asian Studies. Also required is knowledge of an Asian language; this is deemed to be fulfilled by 20 semester hours or equivalent in Chinese, Indonesian, Japanese, Thai, or Vietnamese. The Southeast Asian Studies Certificate is awarded to Geography students who emphasize regional studies specialization in Geography and one year of Indonesian, Thai, or Vietnamese. For more information, see “Asian Studies,” page 324, and “Southeast Asian Studies,” page 327.

Latin American Studies Emphasis. Students majoring in Geography may elect to pursue a Latin American studies concentration combining courses from the major with selected outside courses of wholly Latin American content. At least 30 upper-division semester hours of the program must be in Latin American content courses, including 15 hours in geography (or in courses approved by the Department of Geography advisor) and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Latin American Studies

Center. See “Latin American Studies,” page 326, for more information.

GEOGRAPHY—B.S.

The B.S. degree consists of classes in core geographic knowledge (10–11 semester hours), core geographic skills and core geographic techniques (15 hours), and electives (12 hours)—for a minimum of 37 hours in geography. At least 18 hours in geography must be in upper-division courses. The remaining nine hours are to be made up of electives from geography courses or related fields of study, chosen in consultation with an advisor.

Core Geographic Knowledge

GCU 102 Introduction to Human Geography <i>SB</i>	3
GCU 121 World Geography <i>SB, G</i>	4
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or GPH 411 Physical Geography (3)	
Total	10–11

Core Geographic Skills

GCU 495 Quantitative Methods in Geography <i>CS</i>	3
GCU 496 Geographic Research Methods <i>L</i>	3
GPH 371 Cartography <i>CS</i>	3
GPH 491 Geographic Field Methods.....	3
Total	12

Core Geographic Techniques

Choose one of the courses below, in consultation with an advisor.....	3
GPH 372 Air Photo Interpretation (3)	
GPH 373 Geographic Information Science I <i>CS</i> (3)	
GPH 471 Cartographic Design <i>CS</i> (3)	

Students seeking the B.S. degree take the required core of eight courses. The remaining four courses (12 hours) of geography electives and 9 hours of geography or related fields of study vary among the options available for a B.S. degree in Geography. There are two specific departmental concentrations: meteorology-climatology and urban studies. In addition, a student can design, in consultation with an advisor, an individualized B.S. degree emphasizing other areas within the major.

Meteorology-Climatology Concentration. See an undergraduate advisor in the Department of Geography for the latest National Weather Service certification requirements. The required courses for the meteorology-climatology concentration include a minimum of 39 semester hours in geography plus eight hours of related mathematics:

Core Courses

GCU 102 Introduction to Human Geography <i>SB</i>	3
GCU 121 World Geography <i>SB, G</i> ¹	4
GCU 495 Quantitative Methods in Geography <i>CS</i>	3
GCU 496 Geographic Research Methods <i>L</i>	3
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or GPH 411 Physical Geography (3)	
GPH 371 Cartography <i>CS</i>	3
GPH 373 Geographic Information Science I <i>CS</i>	3
or another three-hour techniques course if GPH 373 is taken to meet a core requirement	

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

GPH 491 Geographic Field Methods.....	3
Total	25–26

Required Meteorology Courses

GPH 213 Introduction to Climatology.....	3
GPH 215 Introduction to Climatology Laboratory.....	1
GPH 409 Synoptic Meteorology I.....	4
GPH 410 Synoptic Meteorology II.....	4
GPH 412 Physical Climatology.....	3
or GPH 413 Meteorological Instruments and Measurement (3)	
or GPH 414 Climate Change <i>G</i> (3)	
Total	15

Mathematics and Physics-Related Courses

MAT 270 Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272 Calculus with Analytic Geometry III <i>MA</i>	4
PHY 121 University Physics I: Mechanics <i>SQ</i> ²	3
PHY 122 University Physics Laboratory I <i>SQ</i> ²	1
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ³	3
PHY 132 University Physics Laboratory II <i>SQ</i> ³	1
Total	20

¹ Three semester hours in transfer courses can also fulfill this requirement.

² Both PHY 121 and 122 must be taken to secure SQ credit.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

Urban Studies Concentration. The required courses for the urban studies concentration are as follows:

Core Courses

GCU 102 Introduction to Human Geography <i>SB</i>	3
GCU 121 World Geography <i>SB, G*</i>	4
GCU 495 Quantitative Methods in Geography <i>CS</i>	3
GCU 496 Geographic Research Methods <i>L</i>	3
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or GPH 411 Physical Geography (3)	
GPH 371 Cartography <i>CS</i>	3
GPH 373 Geographic Information Science I <i>CS</i>	3
or another three-hour techniques course if GPH 373 is taken to meet a core requirement	
GPH 491 Geographic Field Methods.....	3
Total	25–26

Required Urban Geography

Choose one of the courses below.....	3
GCU 351 Population Geography <i>SB, G</i> (3)	
GCU 357 Social Geography <i>SB</i> (3)	
GCU 364 Energy in the Global Arena <i>SB, G</i> (3)	
GCU 441 Economic Geography <i>SB</i> (3)	
GCU 442 Geographical Analysis of Transportation <i>SB</i> (3)	
One upper-division or graduate-level GCU course chosen in consultation with an advisor (3)	
Choose two of the courses below.....	6
GCU 359 Cities of the World I <i>SB, G, H</i> (3)	
GCU 360 Cities of the World II <i>SB, G</i> (3)	
GCU 444 Geographic Studies in Urban Transportation <i>SB</i> (3)	
GCU 494 ST: Geography of Phoenix (3)	
GCU 361 Urban Geography <i>SB</i>	3

GCU 484 Internship.....	3
or one upper-division elective course outside the department in a related field of study chosen in consultation with an advisor (3)	
Urban geography total.....	15

* Three semester hours in transfer courses can also fulfill this requirement.

SECONDARY EDUCATION—B.A.E.

The Department of Geography, in conjunction with the College of Education, offers courses toward a Bachelor of Arts in Education degree. The B.A.E. degree consists of 45 semester hours, of which a minimum of 30 must be in geography and 15 in a related teaching field or fields. The following courses are required:

GCU 102 Introduction to Human Geography <i>SB</i>	3
GCU 121 World Geography <i>SB, G*</i>	4
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or GPH 411 Physical Geography (3)	
Total	10–11

* Three semester hours in transfer courses can also fulfill this requirement.

In conjunction with an advisor, students choose remaining credits from three groups of human, physical, and regional courses.

MINOR IN GEOGRAPHY

A minor in Geography is awarded to students who complete a minimum of 18 hours in geography. A letter grade of “C” or higher is required for all courses taken for the minor.

The following lower-division courses are required:

GCU 102 Introduction to Human Geography <i>SB</i>	3
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
or GPH 411 Physical Geography (3)	
Total	6–7

The remaining courses are selected in conjunction with an advisor. At least one course should be a geographic skill, for example, map reading (GPH 271), cartography (GPH 371), air photo interpretation (GPH 372), geographic field methods (GPH 491), or a class in geographic information science (GPH 373). At least four courses should be upper-division classes in human, physical, or regional geography.

CULTURAL GEOGRAPHY (GCU)**GCU 102 Introduction to Human Geography. (3)**

fall and spring

Systematic study of human use of the earth. Spatial organization of economic, social, political, and perceptual environments.

General Studies: SB

GCU 121 World Geography. (4)

fall and spring

Description and analysis of areal variations in social, economic, and political phenomena in major world regions.

General Studies: SB, G

GCU 141 Introduction to Economic Geography. (3)

fall

Production, distribution, and consumption of various types of commodities of the world and relationships to the activities of humans.

General Studies: SB, G

GCU 200 Orientation to Geography. (1)*fall*

Basic introduction to the Department of Geography faculty, undergraduate graduation requirements, and possible jobs and skills in geography. Cross-listed as GPH 200. Credit is allowed for only GCU 200 or GPH 200.

GCU 240 Introduction to Southeast Asia. (3)*fall*

Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/HST 240/POS 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.

*General Studies: G***GCU 253 Introduction to Cultural and Historical Geography. (3)***not regularly offered*

Cultural patterns, including such phenomena as language, religion, and various aspects of material culture. Origins and diffusion and division of the world into cultural areas.

*General Studies: SB, G***GCU 294 Special Topics. (4)***once a year*

Topics include global awareness.

GCU 322 Geography of U.S. and Canada. (3)*fall*

Spatial distribution of relevant physical, economic, and cultural phenomena in the United States and Canada.

*General Studies: SB, C***GCU 323 Geography of Latin America. (3)***fall*

Spatial distribution of relevant physical, economic, and cultural phenomena in South, Middle, and Caribbean America.

*General Studies: SB, G***GCU 325 Geography of Europe. (3)***once a year*

Broad and systematic overview of Europe, emphasizing physical, economic, and cultural phenomena.

*General Studies: SB, G***GCU 326 Geography of Asia. (3)***fall*

Spatial distribution of relevant physical, economic, and cultural phenomena in Asia, excluding the former Soviet Union.

*General Studies: SB, G***GCU 327 Geography of Africa. (3)***not regularly offered*

Spatial distribution of relevant physical, economic, and cultural phenomena in Africa.

*General Studies: SB, G***GCU 328 Geography of Middle East and North Africa. (3)***not regularly offered*

Spatial distribution of relevant physical, economic, and cultural phenomena in the Middle East and North Africa. Prerequisite: GCU 121 or instructor approval.

*General Studies: SB, G***GCU 332 Geography of Australia and Oceania. (3)***once a year*

Spatial distribution of relevant physical, economic, and cultural phenomena in Australia, New Zealand, and Pacific Islands.

*General Studies: SB, G***GCU 344 Geography of Hispanic Americans. (3)***spring*

Examines the homelands, migrations, settlements, landscapes, roles, and selected cultural traditions of Hispanic Americans.

*General Studies: SB, C***GCU 350 The Geography of World Crises. (3)***fall and spring*

Contemporary world crises viewed from a perspective of geographic concepts and techniques.

*General Studies: SB, G***GCU 351 Population Geography. (3)***fall*

Demographic patterns; spatial, temporal, and structural investigation of the relationship of demographic variables to cultural, economic, and environmental factors.

*General Studies: SB, G***GCU 352 Political Geography. (3)***not regularly offered*

Relationship between the sociophysical environment and the state.

*General Studies: SB, G***GCU 357 Social Geography. (3)***once a year*

Environmental perception of individuals and groups. Stresses the spatial aspect of social and physical environments.

*General Studies: SB***GCU 359 Cities of the World I. (3)***fall*

Historical evolution of urban patterns and structures in the Middle East, India, Southeast Asia, China, Japan, and Europe.

*General Studies: SB, G, H***GCU 360 Cities of the World II. (3)***not regularly offered*

Historical evolution of urban patterns and structures in Latin America, North America, Sub-Saharan Africa, and Australasia.

*General Studies: SB, G***GCU 361 Urban Geography. (3)***fall and spring*

External spatial relations of cities, internal city structure, and spatial aspects of urban problems in various parts of the world, particularly in the United States.

*General Studies: SB***GCU 364 Energy in the Global Arena. (3)***spring*

Production, transportation, and consumption of energy, emphasizing the electric power industry and its environmental problems.

*General Studies: SB, G***GCU 394 Special Topics. (1–4)***fall and spring***GCU 421 Geography of Arizona and Southwestern United States. (3)***fall and spring*

Geography of the Southwest with an emphasis on Arizona. Divided into physical geography, history, people, and economy.

*General Studies: SB, C***GCU 423 Geography of South America. (3)***not regularly offered*

Prerequisite: GCU 323 or instructor approval.

*General Studies: SB, G***GCU 424 Geography of Mexico and Middle America. (3)***once a year*

Central America and Mexico. Prerequisite: GCU 323 or instructor approval.

*General Studies: SB, G***GCU 425 Geography of the Mexican American Borderland. (3)***spring*

Geography of a binational and bicultural region. Examination of settlement, boundary issues, ethnic subregions, population change, industrial development, and urban growth. Fee.

*General Studies: L/SB, G***GCU 426 Geography of Russia and Surroundings. (3)***not regularly offered*

Examines the geography of Russia and other post-Soviet states. Prerequisite: GCU 121 or instructor approval.

*General Studies: SB, G***GCU 432 Geography of China. (3)***not regularly offered*

Examines the physical, economic, cultural, social, demographic, agricultural, political, historical, and environmental aspects of the geography of China. Lecture, discussion.

General Studies: SB, G

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

GCU 433 Geography of Southeast Asia. (3)*spring*

Examines the biophysical and social features of Southeast Asian nations and peoples. Prerequisite: GCU 326 or instructor approval.

GCU 441 Economic Geography. (3)*once a year*

Spatial distribution of primary, secondary, and tertiary economic and production activities. Prerequisite: GCU 141 or instructor approval.

*General Studies: SB***GCU 442 Geographical Analysis of Transportation. (3)***fall*

Networks, modes, economics, and flows at the urban, national, and international scales. Prerequisite: GCU 141 or 441.

*General Studies: SB***GCU 444 Geographic Studies in Urban Transportation. (3)***spring*

Current urban transportation issues in metropolitan Phoenix. Lecture, team project. Prerequisite: GCU 361.

*General Studies: SB***GCU 453 Recreational Geography. (3)***not regularly offered*

Examines problems surrounding the organization and use of space for recreation. Introduces geographic field survey methods of data collection and analysis. Saturday field trips may be required.

GCU 455 Historical Geography of U.S. and Canada. (3)*not regularly offered*

Geographical perspective on the evolution of the United States and Canada from pre-Columbian times to early 20th century.

*General Studies: SB, H***GCU 474 Public Land Policy. (3)***not regularly offered*

Geographic aspects of federal public lands, policy, management, and issues. Emphasis on western wilderness and resource development problems.

*General Studies: SB***GCU 484 Internship. (3)***fall and spring***GCU 494 Special Topics. (1–4)***once a year*

Possible topics:

- (a) Geography of Phoenix. (3)

GCU 495 Quantitative Methods in Geography. (3)*fall and spring*

Statistical techniques applied to the analysis of spatial distributions and relationships. Introduction to models and theory in geography. Prerequisite: MAT 119.

*General Studies: CS***GCU 496 Geographic Research Methods. (3)***fall and spring*

Scientific techniques used in geographic research. Prerequisites: GCU 495; GPH 371, 491.

*General Studies: L***GCU 515 Human Migration. (3)***fall*

Economic, political, social, and geographic factors underlying population movements. Migration selectivity, streams and counter-streams, labor migration, and migration decision making. Lecture, seminar. Prerequisite: GCU 351 or instructor approval.

GCU 526 Spatial Land-Use Analysis. (3)*not regularly offered*

Determination, classification, and analysis of spatial variations in land-use patterns. Examines the processes affecting land-use change. Prerequisite: 15 hours in geography or instructor approval.

GCU 529 Contemporary Geographic Thought. (3)*fall*

Comparative evaluation of current philosophy concerning the nature and trends of geography. Prerequisites: 15 hours in geography; instructor approval.

GCU 585 Advanced Research Methods in Geography. (3)*spring*

Specialized research techniques and methodologies in economic, political, or cultural geography.

GCU 591 Seminar. (1–3)*fall, spring, summer*

Selected topics in economic, political, or cultural geography. Field trips may be required.

GCU 596 History of Geographic Thought. (3)*not regularly offered*

Historical development of geographic thought from pre-Greek days to the early 20th century.

GCU 599 Thesis. (6)*fall and spring***PHYSICAL GEOGRAPHY (GPH)****GPH 111 Introduction to Physical Geography. (4)***fall and spring*

Spatial and functional relationships among climates, landforms, soils, water, and plants. Credit is allowed for only GPH 111 or 411. 3 hours lecture, 3 hours lab. Required field trips. Fee.

*General Studies: SQ***GPH 200 Orientation to Geography. (1)***fall*

Basic introduction to the Department of Geography faculty, undergraduate graduation requirements, and possible jobs and skills in geography. Cross-listed as GCU 200. Credit is allowed for only GCU 200 or GPH 200.

GPH 210 Society and Environment. (3)*fall*

Examines the interaction between social processes, key environmental issues, and nature's role as a resource at global and regional scales.

*General Studies: G***GPH 211 Landform Processes. (3)***spring*

Geographic characteristics of landforms and earth-surface processes, emphasizing erosion, transportation, deposition, and implications for human management of the environment. Fee. Prerequisites: ENG 101 (or 105); GPH 111.

*General Studies: L***GPH 212 Introduction to Meteorology. (3)***fall*

Fundamentals of weather and climate, including basic atmospheric processes and elements. Students whose curricula require a laboratory course must also register for GPH 214. Prerequisite: GPH 111 or instructor approval.

*General Studies: SG (if credit also earned in GPH 214)***GPH 213 Introduction to Climatology. (3)***spring*

Fundamentals of meteorological/climatological analysis, including terminology and symbology. Recommended for meteorology/climatology program students. Prerequisite: instructor approval.

GPH 214 Introduction to Meteorology Laboratory. (1)*fall*

Introduction to basic meteorological/climatological data and measurements. 3 hours lab. Suggested concurrent enrollment in GPH 212.

*General Studies: SG (if credit also earned in GPH 212)***GPH 215 Introduction to Climatology Laboratory. (1)***spring*

Fundamentals of meteorological/climatological map analysis and interpretation. Recommended for meteorology/climatology program students. May be taken concurrently with GPH 213. Prerequisite: instructor approval.

GPH 271 Maps and Map Reading. (3)*once a year*

Map types, uses, limitations, and evolution. Communication via paper and digital medium. Navigation, interpretation, projections, sources, symbols, classification, case, handling.

GPH 314 Global Change. (3)*fall*

Response of Earth's natural systems (atmosphere, hydrosphere, lithosphere, biosphere) to past environmental change, and effects of potential future changes.

General Studies: HU, G

GPH 370 Geographic Information Technologies. (3)*fall and spring*

Introduction to modern geographic information technologies, including cartography, GIS, remote sensing, global positioning systems, and statistical analyses. Lecture, lab.

GPH 371 Cartography. (3)*fall and spring*

Philosophy and practical aspects of map production; employs communications, symbolism, data manipulation, presentation, decision making, generalization, linework, lettering, digital media. Prerequisite: GPH 111.

*General Studies: CS***GPH 372 Air Photo Interpretation. (3)***once a year*

Subset, remote sensing, includes: photography, films, aerial geometry, image components, stereoscopy, photogrammetry, ground truthing, interpret physical, cultural, economic, intelligence information. Prerequisite: GPH 211 or any Cultural Geography (GCU) course or instructor approval.

GPH 373 Geographic Information Science I. (3)*fall*

History and basic aspects of GIS including map and data file structure, conversions, and synthesis with a computerized environment. Prerequisite: GPH 370.

*General Studies: CS***GPH 381 Geography of Natural Resources. (3)***once a year*

Nature and distribution of natural resources and the problems and principles associated with their use.

*General Studies: G***GPH 394 Special Topics. (1–4)***fall and spring*

Possible topics:

- (a) Geographic Information Science. (3)

GPH 401 Topics in Physical Geography. (1–3)*once a year*

Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: instructor approval.

GPH 405 Energy and Environment. (3)*spring*

Sources, regulatory and technical controls, distribution, and consequences of the supply and human use of energy. Prerequisite: physical or life sciences courses or instructor approval.

GPH 409 Synoptic Meteorology I. (4)*fall*

Diagnostic techniques and synoptic forecasting. Includes techniques of weather analysis, map interpretation, and satellite and radar analysis. Prerequisites: MAT 270; PHY 131, 132.

GPH 410 Synoptic Meteorology II. (4)*spring*

Diagnostic techniques and synoptic forecasting. Includes techniques of weather analysis, map interpretation, and satellite and radar analysis. Prerequisite: GPH 409.

GPH 411 Physical Geography. (3)*once a year*

Introduction to physiography and the physical elements of the environment. Credit is allowed for only GPH 411 or 111. Field trips.

GPH 412 Physical Climatology. (3)*once a year*

Physical processes in the earth-atmosphere system on regional and global scales; concepts and analysis of energy, momentum, and mass balances. Prerequisites: both GPH 212 and 213 or only instructor approval.

GPH 413 Meteorological Instruments and Measurement. (3)*once a year*

Design and operation of ground-base and aerological weather measurement systems. Collection, reduction, storage, retrieval, and analysis of data. Required field trips. Prerequisites: both GPH 212 and 213 or only instructor approval.

GPH 414 Climate Change. (3)*spring*

Survey of three climate research areas: paleoclimatology, theories (e.g., greenhouse warming), numerical modeling. Prerequisite: GPH 212 or instructor approval.

*General Studies: G***GPH 418 Landforms of the Western United States. (3)***once a year*

Studies landforms and geomorphic processes in the western United States, including lecture, topographical maps, aerial photographs, satellite imagery, and field trips. Lecture, critical inquiry, laboratory, field work. Fee. Prerequisites: GPH 211 (or its equivalent); completion of General Studies L course.

*General Studies: L***GPH 422 Plant Geography. (3)***not regularly offered*

Plant communities of the world and their interpretation, emphasizing North American plant associations. Cross-listed as PLB 422. Credit is allowed for only GPH 422 or PLB 422. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 or only GPH 111.

GPH 433 Alpine and Arctic Environments. (3)*not regularly offered*

Regional study of advantages and limitations of the natural environment upon present and future problems involving resource distribution, human activities, and regional and interregional adjustments. Required field trips. Prerequisite: GPH 111 or instructor approval.

*General Studies: G***GPH 471 Cartographic Design. (3)***fall*

Advanced design using desktop mapping. Cartographic decision making, qualitative and quantitative symbol design, projections, color. Prerequisites: GPH 371 or instructor approval.

*General Studies: CS***GPH 473 Geographic Information Science II. (3)***fall*

GIS as a basis for microcomputer spatial analysis and synthesis. Includes digitizing, database organization, spatial retrieval, and graphics. Prerequisite: GPH 373.

*General Studies: CS***GPH 474 Dynamic Meteorology I. (3)***fall*

Large-scale atmospheric motion, kinematics, Newton's laws, wind equation, baroclinics, vorticity, and the midlatitude depression. Prerequisites: GPH 213, 215; MAT 271; PHY 131, 132.

GPH 475 Dynamic Meteorology II. (3)*spring*

Topics in climate dynamics. General circulation, numerical modeling, teleconnection phenomena, and surface-atmosphere interaction. Prerequisite: GPH 474 or instructor approval.

GPH 481 Environmental Geography. (3)*once a year*

Problems of environmental quality, including uses of spatial analysis, research design, and field work in urban and rural systems. Required field trips. Prerequisite: instructor approval.

GPH 484 Geography Internship. (3)*fall and spring*

Assist in teaching sixth-grade students a simplified version of GPH 111 using hands-on activities.

GPH 491 Geographic Field Methods. (3)*spring and summer*

Field techniques, including use of aerial photos, large-scale maps, and fractional code system of mapping; urban and rural field analysis to be done off campus. Travel fees required. Fee. Prerequisites: GCU 102, 121; GPH 111.

GPH 511 Fluvial Processes. (3)*once a year*

Geographical aspects of processes of river erosion, transportation, sedimentation: emphasizing spatial characteristics of forces, resistance, landforms, sediment; includes computer applications. Prerequisites: both GPH 111 (or GLG 101) and 211 (or GLG 362) or only instructor approval.

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GPH 533 Snow and Ice. (3)*spring*

Processes, distribution, climatic interactions of snow/ice emphasizing mass balance, snow stratigraphy/metamorphism and glacier/snow-pack climatology. Lecture, field work. Prerequisite: instructor approval.

GPH 573 Computer Mapping and Graphics. (3)*once a year*

Utilization of the digital computer in analysis and mapping of geographic data. Includes plotting, surficial display, compositing, and graphics. Field trips. Prerequisites: GPH 371; instructor approval.

GPH 575 Geographic Applications of Remote Sensing. (3)*not regularly offered*

Uses imaging and nonimaging methods of remote acquisition of data, including satellite sensors, airborne radar, multiband scanning, conventional photographic sensors, and ground-based equipment. Required field trips. Prerequisites: GCU 585 (or GPH 491); GPH 372.

GPH 591 Seminar. (1–3)*fall and spring*

Selected topics in physical geography. Field trips may be required.

GPH 596 Advanced Spatial Statistics. (3)*spring*

Multivariate and advanced statistical techniques including Box-Jenkins modeling and spectral analysis. Project papers and presentations required. Seminar. Prerequisite: GCU 495 (or its equivalent).

GPH 599 Thesis. (6)*fall and spring*

Department of Geological Sciences

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REGENTS' PROFESSORS

BUSECK, GREELEY, MOORE

PROFESSORS

BURT, CHRISTENSEN, FARMER, FINK, HOLLOWAY,
KNAUTH, LARIMER, PEACOCK, REYNOLDS, STUMP,
TYBURCZY, WILLIAMS

ASSOCIATE PROFESSORS

O'DAY, SHARP

ASSISTANT PROFESSORS

ARROWSMITH, FOUCH, GARNERO, LESHIN, TANG

GEOLOGICAL SCIENCES—B.S.

The B.S. degree in Geological Sciences requires 39 semester hours including the following core courses or their equivalents:

GLG 101 Introduction to Geology I (Physical) $SQ^1 G$	3
GLG 102 Introduction to Geology II (Historical) $SG^2 H$	3
GLG 103 Introduction to Geology I—Laboratory SQ^1	1
GLG 104 Introduction to Geology II—Laboratory SG^2	1
GLG 310 Structural Geology	3
GLG 321 Mineralogy	3
GLG 400 Geology Colloquium	1
GLG 424 Petrology	3
GLG 435 Sedimentology	3
GLG 451 Field Geology I	3

GLG 452 Field Geology II	3
Total	27

¹ Both GLG 101 and 103 must be taken to secure SQ credit.² Both GLG 102 and 104 must be taken to secure SG credit.

In addition, two of the following four branch courses must be taken:

GLG 335 Paleontology	3
GLG 418 Geophysics	3
GLG 470 Hydrogeology	3
GLG 481 Geochemistry	3

To complete the total required hours, other upper-division courses in geological sciences (excluding GLG 300 and 304) or courses in related fields listed as approved by the department may be taken. See "College Degree Requirements," page 319.

Supporting courses required in related fields include:

CHM 113 General Chemistry SQ	4
CHM 116 General Chemistry SQ	4
MAT 270 Calculus with Analytic Geometry I MA	4
MAT 271 Calculus with Analytic Geometry II MA	4
MAT 272 Calculus with Analytic Geometry III MA	4
or MAT 274 Elementary Differential Equations MA (3)	
PHY 121 University Physics I: Mechanics SQ^1	3
PHY 122 University Physics Laboratory I SQ^1	1
PHY 131 University Physics II: Electricity and Magnetism SQ^2	3
PHY 132 University Physics Laboratory II SQ^2	1
Total	28

¹ Both PHY 121 and 122 must be taken to secure SQ credit.² Both PHY 131 and 132 must be taken to secure SQ credit.

MAT 290 Calculus I and MAT 291 Calculus II may be substituted for MAT 270, 271, and 272.

MINOR IN GEOLOGICAL SCIENCES

A minor in Geological Sciences is awarded to students who complete a minimum of 21 hours of geological science courses. Required courses are as follows:

GLG 101 Introduction to Geology I (Physical) $SQ^1 G$	3
GLG 102 Introduction to Geology II (Historical) $SG^2 H$	3
GLG 103 Introduction to Geology I—Laboratory SQ^1	1
GLG 104 Introduction to Geology II—Laboratory SG^2	1
GLG 310 Structural Geology	3
GLG 321 Mineralogy	3
GLG 400 Geology Colloquium	1
Total	15

¹ Both GLG 101 and 103 must be taken to secure SQ credit.² Both GLG 102 and 104 must be taken to secure SG credit.

The remaining six semester hours may be chosen among other upper-division geological sciences courses, except GLG 300 and 400, after consultation with a departmental advisor.

GRADUATE PROGRAMS

The faculty in the Department of Geological Sciences offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the *Graduate Catalog* for requirements.

GEOLOGICAL SCIENCES (GLG)

GLG 101 Introduction to Geology I (Physical). (3)

fall, spring, summer

Basic principles of geology, geochemistry, and geophysics. Rocks, minerals, weathering, earthquakes, mountain building, volcanoes, water, and glaciers. Possible weekend field trips.

General Studies: SQ (if credit also earned in GLG 103), G

GLG 102 Introduction to Geology II (Historical). (3)

spring

Basic principles of applied geology and the use of these principles in the interpretation of geologic history. Possible weekend field trips.

Fee. Prerequisite: GLG 101.

General Studies: SG (if credit also earned in GLG 104), H

GLG 103 Introduction to Geology I—Laboratory. (1)

fall, spring, summer

3 hours lab, some field trips. Fee. Corequisite: GLG 101.

General Studies: SQ (if credit also earned in GLG 101)

GLG 104 Introduction to Geology II—Laboratory. (1)

spring

Laboratory techniques involving map interpretation, cross sections, and fossils. 3 hours lab, possible field trips. Prerequisite: GLG 103 (or its equivalent). Corequisite: GLG 102.

General Studies: SG (if credit also earned in GLG 102)

GLG 105 Introduction to Planetary Science. (4)

spring

Solar system objects and their geologic evolution, surfaces, interiors, and atmospheres; weekly laboratory for data analysis and experiments; weekend field trip. Lecture, lab.

General Studies: SG

GLG 110 Environmental Geology. (3)

fall

Geological studies as they apply to interactions between humans and earth. Includes geological processes and hazards, resources, and global change.

General Studies: SG (if credit also earned in GLG 111), G

GLG 111 Environmental Geology Laboratory. (1)

fall

Basic geological processes and concepts. Emphasis on geology-related environmental problems concerning Arizona. Case histories and field studies. Lab. Corequisite: GLG 110.

General Studies: SG (if credit also earned in GLG 110)

GLG 294 Special Topics. (1–4)

not regularly offered

Possible topics:

- (a) Geology of the Planets
Fee.

GLG 300 Geology of Arizona. (3)

once a year

Basic and historical geology, fossils, mining, energy resources, environmental problems, landscape development, and meteorites, cast in examples from Arizona. Majors who have taken GLG 101 for credit may not enroll.

GLG 304 Geology of the Grand Canyon. (2)

not regularly offered

Reviews the discovery, history, origin, and geology of the Grand Canyon of the Colorado River in Arizona. 6-day field trip down the river (first 6 days after commencement in May) required at student's expense. Field research and term paper on trip also required.

GLG 310 Structural Geology. (3)

spring

Geologic structures and the mechanical processes involved in their formation. 2 hours lecture, 3 hours lab. Possible field trips. Fee. Prerequisites: GLG 101; MAT 270 (or 290).

GLG 321 Mineralogy. (3)

fall

Crystal chemistry, crystallography, mineral identification, origin and occurrence of minerals, systematic mineralogy. 2 hours lecture, 3 hours lab, possible field trips. Prerequisites: CHM 113; MAT 270 (or 290). Pre- or corequisite: CHM 116.

GLG 335 Paleontology. (3)

fall

Introduction to concepts and analytical techniques in biogeology, paleobiology, paleoecology, and paleoenvironmental reconstruction from the fossil record. 2 hours lecture, 3 hours lab. Fee. Prerequisites: both GLG 102 and MAT 270 (or 290) or only instructor approval.

GLG 336 Invertebrate Paleontology. (3)

not regularly offered

Biology, skeletal morphology, and systematics of fossil invertebrates. One or two projects emphasizing population analysis and techniques in paleontology. Lecture, 6 hours lab, possible field trips. Fee. Prerequisite: GLG 102 or instructor approval. Pre- or corequisite for Geological Sciences majors: GLG 335.

GLG 362 Geomorphology. (3)

not regularly offered

Land forms and processes which create and modify them. Laboratory and field study of physiographic features. 2 hours lecture, 3 hours lab, possible weekend field trips. Prerequisite: GLG 101. Pre- or corequisite: GLG 310.

GLG 400 Geology Colloquium. (1)

fall and spring

Presentation of recent research by faculty and guests. Written assignments required. 1 semester hour required for Geological Sciences majors; may be repeated for a total of 2 semester hours. Prerequisite: 2 courses in the department or instructor approval.

GLG 405 Geology of the Moon. (3)

not regularly offered

Current theories of the origin and evolution of the moon through photogeological analyses and consideration of geochemical and geophysical constraints. Possible field trips to examine Arizona geology. Fee. Prerequisite: GLG 105 or instructor approval.

GLG 406 Geology of Mars. (3)

not regularly offered

Geological evolution of Mars through analyses of spacecraft data, theoretical modeling, and study of terrestrial analogs; emphasis on current work. Possible field trips to examine Arizona geology. Fee. Prerequisite: GLG 105 or instructor approval.

GLG 410 Computers in Geology. (3)

fall

Geological computer skills including data processing, visualization, presentation, numerical analysis, software and hardware applications. 2 hours lecture, 3 hours lab. Prerequisites: both GLG 101 and one upper-division geology course or only instructor approval.

GLG 412 Geotectonics. (3)

not regularly offered

Earthquakes, earth's interior, formation of oceanic and continental crust, and plate tectonics. Emphasis on current work. Prerequisite: GLG 310.

GLG 416 Field Geophysics. (3)

spring

Methods of applied geophysical exploration; seismic refraction, gravity, electrical resistivity, geomagnetics. Includes survey planning, data acquisition, processing, analysis, and interpretation. Lecture, field exercises. Prerequisite: one course in geology or instructor approval.

GLG 418 Geophysics. (3)

fall

Solid earth geophysics; geomagnetism, gravity, seismology, heat flow. Emphasis on crust and upper mantle. Prerequisites: a combination of GLG 310 and MAT 272 and PHY 131 or only instructor approval.

GLG 419 Geodynamics. (3)

not regularly offered

Emphasis on application of continuum principles to geological problems, including lithospheric stresses, heat transfer, fluid mechanics, and rock rheology. Prerequisite: PHY 131.

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GLG 420 Volcanology. (3)*once a year*

Distribution of past and present volcanism, types of volcanic activity, mechanism of eruption, form and structure of volcanoes, and geochemistry of volcanic activity. Possible weekend field trips. Fee. Prerequisite: GLG 424.

GLG 424 Petrology. (3)*fall*

Origin of igneous and metamorphic rocks. Optical mineralogy, hand specimen identification, and thin-section analysis. 2 hours lecture, 3 hours lab, possible weekend field trips. Fee. Prerequisite: GLG 321.

GLG 435 Sedimentology. (3)*spring*

Origin, transport, deposition, and diagenesis of sediments and sedimentary rocks. Physical analysis, hand specimen examination, and interpretation of rocks and sediments. 2 hours lecture, 3 hours lab, possible weekend field trips. Fee. Prerequisites: GLG 102, 321.

GLG 441 Ore Deposits. (3)*not regularly offered*

Origin, occurrence, structure, and mineralogy of ore deposits. Possible weekend field trips. Fee. Prerequisite: GLG 424 or instructor approval.

GLG 451 Field Geology I. (3)*spring*

Geological mapping techniques using topographic maps and aerial photos. Intensive field-based instruction. Lab. Prerequisites: GLG 310, 321.



Nicole Hsu (left), plays Scrabble with high school student Shadrach Relf as part of a summer reading program.

Tim Trumble photo

GLG 452 Field Geology II. (3)*summer*

Continuation of GLG 451. Lab. Prerequisite: GLG 451.

GLG 455 Advanced Field Geology. (3–4)*once a year*

Geologic mapping in igneous, sedimentary, and metamorphic terrains of the Basin and Range province of Arizona. May be repeated for credit. Weekend field trips. Fee. Prerequisite: instructor approval.

GLG 456 Cordilleran Regional Geology. (3)*not regularly offered*

Systematic coverage through space and time of the geological development of western North America, emphasizing the western United States. Fee. Prerequisite: senior major or graduate student in Geological Sciences or instructor approval.

GLG 470 Hydrogeology. (3)*spring*

Geology of groundwater occurrence, aquifer and well hydraulics, water chemistry and quality, contaminant transport, remediation. Emphasis on quantitative methods. Prerequisites: GLG 101 (or 103); MAT 270; PHY 121.

GLG 481 Geochemistry. (3)*spring*

Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere, and lithosphere. Cross-listed as CHM 481. Credit is allowed for only CHM 481 or GLG 481. Prerequisite: CHM 341 (or 346) or GLG 321.

GLG 484 Geology Internship. (3)*fall and spring*

Assist in teaching fifth-grade students a simplified version of GLG 103 using hands-on activities.

GLG 485 Meteorites and Cosmochemistry. (3)*not regularly offered*

Chemistry of meteorites and their relationship to the origin of the earth, solar system, and universe. Cross-listed as CHM 485. Credit is allowed for only CHM 485 or GLG 485.

GLG 490 Topics in Geology. (1–3)*fall, spring, summer*

Special topics in a range of fields in geology. May be repeated for credit. Fee. Prerequisite: instructor approval.

GLG 495 Undergraduate Thesis. (3)*fall, spring, summer*

Guided research culminating in the completion and presentation of an undergraduate thesis based on supervised research. Independent study. Prerequisite: GLG 499 (3 hours); formal conference with instructor; instructor and department chair approval.

GLG 499 Individualized Instruction. (1–3)*not regularly offered***GLG 500 Geology Colloquium. (1)***fall and spring*

Presentation of recent research by faculty and invited guests. 1 semester required for all Geological Sciences graduate students. May be repeated for a total of 2 semesters. Research paper required. Prerequisite: instructor approval.

GLG 501 Geology of Arizona. (3)*once a year*

Basic and historical geology, fossils, mining, energy resources, environmental problems, landscape development, and meteorites, cast in examples from Arizona. Research paper required.

GLG 504 Geology of the Grand Canyon. (2)*not regularly offered*

Review of the discovery, history, origin, and geology of the Grand Canyon of the Colorado River in Arizona. 6-day field trip down the river (first 6 days after commencement in May) required at student's expense. Field research and term paper on trip also required.

GLG 510 Advanced Structural Geology. (3)*not regularly offered*

Mechanics of rock deformation, emphasizing relationship between field observation, theory, and experiment. Stress, strain, simple constitutive relationships, failure criteria, and the basis of continuum methods. Possible field trips. Fee. Prerequisites: both GLG 310 and 424 or only instructor approval.

GLG 520 Advanced Physical Volcanology. (2–3)*not regularly offered*

Selected volcanologic topics, including explosive eruption processes, lava flow mechanics, and intrusive mechanisms. Possible field trips. Fee. Prerequisite: GLG 420 or instructor approval.

GLG 524 Advanced Igneous Petrology. (3)*not regularly offered*

Theoretical and practical aspects of the genesis of igneous rocks. Study of selected sites. Modern laboratory techniques. 2 hours lecture, 3 hours lab, possible weekend field trips. Fee. Prerequisite: GLG 424.

GLG 581 Isotope Geochemistry. (3)*not regularly offered*

Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: instructor approval.

GLG 582 Physical Geochemistry. (3)*not regularly offered*

Applies thermodynamic and kinetic principles to geochemical processes. Prerequisite: CHM 341 (or 346) or GLG 321.

GLG 583 Phase Equilibria and Geochemical Systems. (3)*not regularly offered*

Natural reactions at high temperatures and pressures; silicate, sulfide, and oxide equilibria. Cross-listed as CHM 583. Credit is allowed for only CHM 583 or GLG 583. Prerequisite: instructor approval.

GLG 591 Seminar. (1–3)*fall, spring, summer*

Topics in a range of fields in geology. May be repeated for credit. Fee. Prerequisite: instructor approval.

GLG 592 Research. (1–12)*fall, spring, summer***GLG 598 Special Topics. (1–4)***fall, spring, summer*

Special topics in geological sciences. May be repeated for credit. Possible topics:

- (a) Advanced Field Geology. (1–3)
Fee.
- (b) Clastic Sedimentology and Petrology. (1–3)
Fee.
- (c) Cordilleran Regional Geology. (1–3)
Fee.
- (d) Fundamental Planetary Geology. (1–3)
- (e) Geology of Mars. (1–3)
Fee.
- (f) Methods in Geoscience Teaching. (1–3)
- (g) Ore Deposits. (1–3)
Fee.
- (h) Orogenic Systems. (1–3)
- (i) Petrology-Petrography. (1–3)
Fee.
- (j) Principles of Stratigraphy. (1–3)
Fee.
- (k) Remote Sensing. (1–3)
- (l) Sedimentology. (1–3)
Fee.
- (m) Volcanology. (1–3)
Fee.

Prerequisite: instructor approval.

GLG 599 Thesis. (1–12)*fall, spring, summer***GLG 792 Research. (1–12)***fall, spring, summer***GLG 799 Dissertation. (1–15)***fall, spring, summer*

Department of History

Noel J. Stowe

Chair

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www.asu.edu/clas/history

CORE FACULTY

Regents' Professor: Iverson;

Professors: Adelson, Batalden, Burg, Davis, Dellheim, Fuchs, Giffin, Gratton, Kleinfeld, Lavrin, Luckingham, Mackinnon, Rosales, Ruiz, Simpson, Stowe, Tambs, Tillman, Trennert, Warnicke;

Associate Professors: Barnes, Carroll, Gray, Gullett, Hendricks, Kahn, Longley, Rush, Samuelson, Smith, Soergel, Stoner, Thornton, VanderMeer, Warren-Findley;

Assistant Professors: Manchester, Thompson, Wilson;

Senior Instructional Professional: Luey

AFFILIATED FACULTY**Chicana and Chicano Studies**

Associate Professor: Escobar

Biology

Professor: Pyne

Women's Studies

Professor: Rothschild

HISTORY—B.A.

The B.A. degree in History consists of 30 semester hours in history and 15 hours in closely related fields, as approved by an undergraduate advisor in consultation with the student. At least 18 hours in history courses and nine hours in related fields must be in upper-division course work, with at least 12 of the upper-division HST hours taken in residence at ASU Main. HST 300 Historical Inquiry and HST 498 Pro-Seminar are required for all degree candidates. (Honors students may substitute HST 493 Honors Thesis for HST 498.)

Students are required to complete course work in two different areas of concentration. One concentration must be defined geographically: Asia, Europe, Latin America, or the United States. The second concentration may be thematic or geographic. Students completing a thematic concentration must complete two courses outside the field of their geographic concentration. At least two history courses in either concentration must include topics outside the United States and Europe. Students must complete at least one course in the HST 302–306 “Studies in History” sequence.

The major includes the following:

1. one concentration of 18 hours (12 hours HST and six hours related field);
2. one concentration of 15 hours (12 hours HST and three hours related field);
3. HST 300, three hours (may be within a concentration);

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

4. HST 498, three hours (may be within a concentration);
5. elective related field courses, six hours;
6. two HST courses with content outside Europe and the United States (may be within a concentration);
7. two HST courses in thematic concentration outside the geographic concentration; and
8. at least one course in the HST 302–306 “Studies in History” sequence as part of one concentration.

A minimum GPA of 2.25 in the 30 hours of history course work is required.

Asian Studies Certificate. Students majoring in History may elect to pursue an Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content. See “Asian Studies,” page 324, for more information.

Jewish Studies Certificate. Students majoring in History may elect to pursue the Jewish Studies Certificate combining courses from the major with selected outside courses of wholly Jewish content. See “Jewish Studies,” page 326, for more information.

Latin American Studies Certificate. Students majoring in History may elect to pursue a Latin American Studies Certificate combining courses from the major with selected outside courses of wholly Latin American content. See “Latin American Studies,” page 326, for more information.

Medieval and Renaissance Studies Certificate. Students majoring in History may elect to pursue the Medieval and Renaissance Studies Certificate by successfully completing the requirements. See “Medieval and Renaissance Studies,” page 326, for more information.

Russian and East European Studies Certificate. Students majoring in History may elect to pursue the Russian and East European Studies Certificate combining courses from the major with selected outside courses of wholly Russian and East European content. See “Russian and East European Studies,” page 326, for more information.

Southeast Asian Studies Certificate. Students majoring in History may elect to pursue the Southeast Asian Studies Certificate combining courses from the major with selected outside courses of wholly Southeast Asian content. See “Southeast Asian Studies,” page 327, for more information.

Women’s Studies Certificate. Students majoring in History may elect to pursue a Women’s Studies Certificate by successfully completing the requirements. See “Women’s Studies,” page 327, for more information.

MINOR IN HISTORY

The History minor consists of 18 semester hours of course work, at least 12 hours of which are in upper-division course work. Students earning a minor in history must complete one 12 hour HST concentration (geographic or thematic), HST 300, and 498. The Department of History requires a grade of at least “C” in all courses in the minor. A minimum of six upper-division hours in the minor must be taken in residence at ASU Main.

SECONDARY EDUCATION—B.A.E.

History. The major teaching field consists of 42 semester hours, of which at least 30 must be in history courses. At least 18 must be in upper-division courses. At least 15 must be in U.S. history. The remaining history and related-area courses must be selected in consultation with an advisor from the Department of History. All degree candidates must complete the following four-course methods block:

HST 300 Historical Inquiry <i>L/SB, H</i>	3
HST 480 Methods of Teaching History: Classroom Resources	3
HST 481 Methods of Teaching History: Community Resources	3
HST 498 PS: History Pro-Seminar <i>L</i>	3

Students should complete HST 300 before enrolling in HST 480, 481, and 498. A minimum GPA of 2.50 in history courses is required for admission to student teaching and for graduation. HST 480 and 481 may not be counted as part of the 42-hour requirement for the academic specialization.

GRADUATE PROGRAMS

The faculty in the Department of History offer programs leading to the M.A. and Ph.D. degrees. A Scholarly Publishing Certificate is also available. See the *Graduate Catalog* for requirements.

HISTORY (HST)

HST 101 Global History Since 1500. (3)

fall and spring

Survey of Africa, the Americas, and Eurasia; changes in communication, communities, demography, economics, environment, politics, religion, technology, warfare, and women. Lecture, CD-ROM, electronic forum, discussion.

General Studies: G, H

HST 102 Western Civilization. (3)

fall and spring

Origins and development of Western societies and institutions from the ancient world through the Middle Ages.

General Studies: SB, H

HST 103 Western Civilization. (3)

fall and spring

Origins and development of Western societies and institutions from Black Death through the Renaissance and Reformation to the Enlightenment.

General Studies: SB, H

HST 104 Western Civilization. (3)

fall and spring

Origins and development of Western societies and institutions from the French Revolution to the present.

General Studies: SB, G, H

HST 105 Slavic Civilization. (3)

fall, spring, summer

Development of Slavic cultures and societies from medieval Byzantium to the present; introduction to modern Eurasia. Lecture, discussion, electronic forum.

General Studies: SB, H

HST 106 Asian Civilizations. (3)

once a year

Civilizations of China, Japan, and India from antiquity to the 17th century.

General Studies: SB, G, H

HST 107 Asian Civilizations. (3)

once a year

Civilizations of China, Japan, India, and Southeast Asia from the 17th century to the present.

General Studies: SB, G, H

HST 108 Introduction to Japan. (3)*fall*

Historical survey of the people, culture, politics, and economy of Japan, supplemented by audiovisual presentations. Intended for non-majors.

General Studies: SB, G, H

HST 109 The United States to 1865. (3)*fall and spring*

Growth of the Republic from the colonial period through the Civil War.

General Studies: SB, H

HST 110 The United States Since 1865. (3)*fall and spring*

Growth of the Republic from the Civil War to the present.

General Studies: SB, H

HST 200 Historical Themes. (3)*once a year*

General introduction to selected themes in history. May be repeated for credit when topics vary.

General Studies: SB, H

HST 201 Historical Themes in Asia. (3)*once a year*

General introduction to selected themes in Asian history. May be repeated for credit when topics vary.

General Studies: SB, H

HST 202 Historical Themes in Europe. (3)*once a year*

General introduction to selected themes in European history. May be repeated for credit when topics vary.

General Studies: SB, H

HST 203 Historical Themes in Latin America. (3)*once a year*

General introduction to selected themes in Latin American history. May be repeated for credit when topics vary.

General Studies: SB, H

HST 204 Historical Themes in the United States. (3)*once a year*

General introduction to selected themes in United States history. May be repeated for credit when topics vary.

General Studies: SB, H

HST 210 American Social History. (3)*once a year*

American society from the colonial period to the present. Ethnicity, race, age, and sex as factors in historical experience. Prerequisite: ENG 101 (or 105).

General Studies: L, H

HST 211 American Jewish History. (3)*not regularly offered*

Chronological analysis of Jews and Judaism in American history and letters.

General Studies: SB, H

HST 212 American Military History. (3)*not regularly offered*

Study of the role of the military in American life during war and peace from colonial times to the present day. 3 hours lecture, conference.

General Studies: SB, H

HST 240 Introduction to Southeast Asia. (3)*fall*

Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/GCU 240/POS 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.

General Studies: G

HST 294 ST: Selected Topics in History. (3)*not regularly offered*

Full description of topics for any semester is available in the Department of History office. May be repeated for credit.

HST 300 Historical Inquiry. (3)*fall and spring*

Historical methods and critical inquiry related to particular events and processes. Topics vary. Required course for majors. Prerequisite for HST 498. Discussion, seminar, lecture. Prerequisites: ENG 102; History major.

General Studies: L/SB, H

HST 302 Studies in History. (3)*once a year*

Specialized topics in history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.

General Studies: SB, H

HST 303 Studies in Asian History. (3)*once a year*

Specialized topics in Asian history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.

General Studies: SB, H

HST 304 Studies in European History. (3)*once a year*

Specialized topics in European history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.

General Studies: SB, H

HST 305 Studies in Latin American History. (3)*once a year*

Specialized topics in Latin American history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.

General Studies: SB, H

HST 306 Studies in United States History. (3)*once a year*

Specialized topics in United States history. Explores regions, cultures, and issues in history, and their interpretation in historical scholarship.

General Studies: SB, H

HST 309 Exploration and Empire. (3)*once a year*

Survey of European discovery, exploration, and imperialism in the early modern and modern periods.

General Studies: L, H

HST 310 Film as History. (3)*once a year*

Survey of moving image media as recorder, object, and writer of history.

General Studies: HU

HST 313 American Cultural History to 1865. (3)*fall and spring*

Culture, including ideas, ideals, the arts, and social and economic standards, from the nation's colonial and early national periods.

General Studies: SB, H

HST 314 American Cultural History Since 1865. (3)*fall and spring*

Culture, including ideas, ideals, the arts, and social and economic standards, from the age of industrialism and modern U.S.

General Studies: SB, H

HST 315 Political History of the United States. (3)*once a year*

American political history since independence, focusing post-1865. Evaluates major trends in issues, presidential leadership, elections, and state politics. Lecture, discussion.

General Studies: SB, H

HST 316 20th-Century U.S. Foreign Relations. (3)*once a year*

U.S. relations with foreign powers from the late 19th century to the present.

General Studies: SB, G, H

HST 318 United States Labor History. (3)*not regularly offered*

American workers, from the colonial period to the present, including farmers, slaves, housewives, the skilled and unskilled, unionized and nonunionized.

General Studies: SB, H

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HST 319 U.S. Urban History to 1850. (3)*once a year*

History of the city in American life from the colonial period to the mid-19th century.

*General Studies: SB, H***HST 320 U.S. Urban History Since 1850. (3)***once a year*

History of the city in American life from the mid-19th century to the present.

*General Studies: SB, H***HST 321 Constitutional History of the United States to 1865. (3)***fall*

Origin and development of the American constitutional system from colonial period through the Civil War.

*General Studies: SB, H***HST 322 Constitutional History of the United States Since 1865. (3)***spring*

Development of the U.S. constitutional system from Reconstruction to the present.

*General Studies: SB, H***HST 325 Immigration and Ethnicity in the United States. (3)***fall and spring*

Origins, historical development, and future of a multiethnic society, 1492 to 2050. Prerequisite: HST 109 or 110.

*General Studies: SB, C, H***HST 327 Women in U.S. History, 1600–1880. (3)***fall and spring*

Examines American women of diverse racial, religious, and ethnic groups, and classes; focuses on changing definitions of women's roles.

*General Studies: SB, C, H***HST 328 Women in U.S. History, 1880–1980. (3)***fall and spring*

Examines American women of diverse racial, religious, and ethnic groups, and classes; focuses on changing definitions of women's roles.

*General Studies: SB, C, H***HST 329 Women in 20th-Century U.S. West. (3)***once a year*

Examines how women of various cultures have contended for and shaped the U.S. West, including the West of imagination. Lecture, discussion.

*General Studies: C, H***HST 330 Mexican Women in the United States: Conquests and Migrations. (3)***once a year*

Overview of Chicana history from Mesoamerican origins to the present, focusing on Mexican women in the western U.S. Lecture, discussion.

*General Studies: L/SB, C, H***HST 331 Mexican American History to 1900. (3)***once a year*

Mexican American history from pre-Hispanic origins to frontier journeys north through 19th-century life in the U.S. Southwest.

*General Studies: SB, H***HST 332 Mexican American History Since 1900. (3)***once a year*

Traces the formation of Mexican American communities across the rural and urban U.S. and examines 20th-century immigration from Mexico.

*General Studies: SB, C, H***HST 333 African American History to 1865. (3)***once a year*

The African American in American history, thought, and culture from slavery to 1865. Cross-listed as AFS 363. Credit is allowed for only AFS 363 or HST 333.

*General Studies: SB, C, H***HST 334 African American History Since 1865. (3)***once a year*

The African American in American history, thought, and culture from 1865 to the present. Cross-listed as AFS 364. Credit is allowed for only AFS 364 or HST 334.

*General Studies: SB, C, H***HST 337 American Indian History to 1900. (3)***fall and spring*

Cultural, economic, political, and social continuity and change of American Indian communities to 1900.

*General Studies: SB, C, H***HST 338 American Indian History Since 1900. (3)***fall and spring*

Cultural, economic, political, and social continuity and change of American Indian communities from 1900 to the present.

*General Studies: SB, C, H***HST 341 The U.S. West in the 19th Century. (3)***once a year*

Social, political, and economic development of the trans-Mississippi West, beginning with the Louisiana Purchase and ending in 1900.

*General Studies: SB, H***HST 342 The U.S. West in the 20th Century. (3)***fall and spring*

Role of the western states in U.S. history since 1890 emphasizing politics, the environment, industry and labor, and ethnic minorities.

*General Studies: SB, H***HST 343 The American Southwest. (3)***once a year*

Development of the region from 1848 to the present.

*General Studies: L/SB, H***HST 344 Arizona. (3)***fall and spring*

Emergence of the state from early times to the present.

*General Studies: SB, H***HST 347 Ancient Greece. (3)***fall*

History and civilization of the Greek world from 650 B.C.E. to the death of Alexander the Great.

*General Studies: SB, H***HST 348 Rome. (3)***spring*

History and civilization of Rome from the beginning of the Republic to the end of the Empire.

*General Studies: SB, H***HST 349 The Early Middle Ages. (3)***fall*

Political, socioeconomic, and cultural developments of Western Europe from the 5th through 10th centuries.

*General Studies: SB, H***HST 350 The Later Middle Ages. (3)***spring*

Political, socioeconomic, and cultural developments of Western Europe from the 11th through 15th centuries.

*General Studies: SB, H***HST 351 Renaissance Europe. (3)***fall*

Culture of the Renaissance in Italy and Northern Europe from the 14th to the early 16th centuries.

*General Studies: L/SB, H***HST 352 Europe's Reformations. (3)***spring*

Causes and implications of the major Protestant, Catholic, and Radical religious reformations in 16th- and 17th-century Europe.

*General Studies: L/SB, H***HST 353 The Old Regime in Europe. (3)***fall*

Society and culture of Europe during the 17th and 18th centuries.

*General Studies: SB, H***HST 354 Revolutionary Europe. (3)***spring*

Political, social, economic, and intellectual currents in Europe from the French through the Russian Revolutions.

*General Studies: SB, H***HST 355 Total War and the Crisis of Modernity. (3)***fall*

Forces of change and instability in early 20th-century Europe.

General Studies: SB, G, H

HST 356 Europe Since 1945. (3)*not regularly offered*

Europe in its world setting since World War II, emphasizing major political and social issues from 1945 to the present.

*General Studies: SB, G, H***HST 358 Jewish History from the Bible to 1492. (3)***fall*

Continuity and change in political, legal, economic, and sociocultural history of the Jews from biblical through medieval times. Lecture, discussion.

HST 359 Jewish History from 1492 to 1948. (3)*spring*

Jewish history from early modern through modern times, highlighting emancipation, enlightenment, and Jewish responses to modernity. Lecture, discussion.

HST 361 Witchcraft and Heresy in Europe. (3)*not regularly offered*

Background, origins, and development of the Inquisition; persecution of women and marginal groups. Cross-listed as REL 374. Credit is allowed for only HST 361 or REL 374. Prerequisite: upper-division standing or instructor approval.

*General Studies: L, H***HST 362 Sex and Society in Classical and Medieval Europe. (3)***fall*

Family life, sex roles, and marriage, and their relationship to political, economic, and religious change in classical and medieval Europe. Lecture, discussion. Prerequisite: upper-division standing or instructor approval.

*General Studies: SB, H***HST 363 Sex and Society in Early Modern Europe. (3)***spring*

Family life, sex roles, and marriage and their relationship to political, economic, and religious change in early modern Europe. Lecture, discussion. Prerequisite: upper-division standing or instructor approval.

*General Studies: SB, H***HST 364 Sex and Society in Modern Europe. (3)***not regularly offered*

Family life, sex roles, and marriage, and their relationship to political, economic, and social changes in modern Europe. Lecture, discussion. Prerequisite: upper-division standing or instructor approval.

*General Studies: L/SB, H***HST 365 Women in Europe. (3)***once a year*

European women's diverse religious, ethnic, national, and economic roles in society, culture, and politics, 1750 to the present.

*General Studies: L/HU/SB, H***HST 366 England to 1689. (3)***once a year*

Political, economic, and social development of the English people to the late 17th century.

*General Studies: SB, H***HST 367 Modern Britain. (3)***once a year*

Political, economic, and social development in Britain from 17th century to the present.

*General Studies: SB, H***HST 368 Culture and Imagination in European History. (3)***once a year*

Topics in European cultural and intellectual history. May be repeated for credit.

*General Studies: HU, H***HST 370 Eastern Europe in Transition. (3)***once a year*

Democratization, privatization, and identity transformations since the fall of communism in contemporary Eastern Europe and the former Soviet Union. Lecture, discussion.

*General Studies: SB, G, H***HST 372 The Modern Middle East. (3)***not regularly offered*

Impact of the West and modernization upon Middle Eastern governments, religion, and society in the 19th and 20th centuries.

*General Studies: SB, G, H***HST 375 Colonial Latin America. (3)***fall and spring*

Ancient civilization, exploration and conquerors, and colonial institutions.

*General Studies: SB, H***HST 376 Modern Latin America. (3)***fall and spring*

Nationalistic development of the independent republics since 1821.

*General Studies: SB, H***HST 377 Women in Colonial Latin America. (3)***fall*

History of women in colonial Latin America, cross-examining class, race, and gender relations in depth. Lecture, discussion.

*General Studies: H***HST 378 Latin American Women: The National Period. (3)***spring*

Surveys the history of women, gender relations, and state policies in a broad continental setting, from independence to the present. Lecture, media, discussion.

*General Studies: SB, G, H***HST 380 Cultural History of Latin America. (3)***not regularly offered*

Main currents of thought, the outstanding thinkers, and their impact on 19th- and 20th-century Latin America. Cultural and institutional basis of Latin American life.

*General Studies: SB, H***HST 383 China. (3)***fall*

Political, economic, social, and cultural history of the Chinese people from early times to the 17th century.

*General Studies: SB, H***HST 384 China. (3)***spring*

Political, economic, social, and cultural history of the Chinese people from the 17th century to the present.

*General Studies: SB, G, H***HST 385 Chinese Science and Medicine. (3)***not regularly offered*

Explores developments of Chinese traditions dealing with the natural world, science, and medicine. Lecture, discussion. Cross-listed as HPS 325. Credit is allowed for only HPS 325 or HST 385.

*General Studies: HU, G, H***HST 386 Interpreting China's Classics. (3)***not regularly offered*

Study of selected Confucian and/or Taoist classics and ways they have been read in both Asian and Western scholarship. Cross-listed as HUM 312. Credit is allowed for only HST 386 or HUM 312.

*General Studies: L/HU, H***HST 387 Japan. (3)***once a year*

Political, economic, social, and cultural history of the Japanese people from early times to the 17th century.

*General Studies: L/SB, H***HST 388 Japan. (3)***once a year*

Political, economic, social, and cultural history of the Japanese people from the 17th century to the present.

*General Studies: SB, G, H***HST 389 Japanese Society and Values: Premodern. (3)***not regularly offered*

Effects of economic and social transitions on personal and social values as reflected in the dramatizations of contemporary events.

HST 391 Modern Southeast Asia. (3)*spring*

Vietnam, Laos, Cambodia, Thailand, Burma, Malaysia, Singapore, Brunei, Indonesia, and Philippines since 1750: imperialism, revolution, and independence. Lecture, discussion.

*General Studies: SB, G, H***HST 394 ST: Selected Topics in History. (3)***fall and spring*

Full description of topics for any semester is available in the Department of History office. May be repeated for credit.

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HST 405 Colonial American History to 1763. (3)*once a year*

Political, economic, social, and cultural history of the colonial era. Concentrates on English colonies, with some consideration of Spanish, French, and other colonial regions in North America.

*General Studies: SB, H***HST 406 The American Revolution, 1763–1789. (3)***once a year*

Causes, course, and consequences of the American Revolution culminating in the ratification of the Constitution.

HST 407 The Early U.S. Republic, 1789–1850. (3)*once a year*

Political, social, economic, and cultural development of the United States from the Revolution to 1850.

*General Studies: L/SB, H***HST 408 Civil War and Reconstruction. (3)***once a year*

Explores the causes, conduct, and consequences of the American Civil War, concentrating on the years 1848 to 1877.

*General Studies: L/SB, H***HST 409 The Emergence of the Modern United States, 1877 to 1918. (3)***once a year*

Triumph of modern political, social, and economic structures and values, 1877–1918; role of region, religion, race, and ethnicity.

*General Studies: SB, H***HST 410 The Modern United States, 1918 to 1945. (3)***once a year*

1920's boom and the crash, the Depression and the New Deal response. The Second World War at home and abroad.

*General Studies: SB, H***HST 411 The Postwar United States, 1945 to 1973. (3)***once a year*

Cold War, prosperity, reform, and immense social and political change in the U.S.

*General Studies: SB, H***HST 412 The Contemporary United States, 1973 to the Present. (3)***once a year*

End of the Cold War, political crises, and cultural transformations in the U.S.

*General Studies: SB, H***HST 414 The Modern U.S. Economy. (3)***not regularly offered*

Origins of 19th-century slavery and industrialization; 20th-century crisis and regulation: political economy of an advanced capitalist democracy. Prerequisite: ECN 111 (or 112) or HST 109 (or 110).

*General Studies: SB, H***HST 415 Unequal Sisters: Women and Political and Cultural Change. (3)***once a year*

Examines race, ethnic, and class differences among women, focusing on the political and cultural experiences of women in the U.S.

*General Studies: L/SB, C, H***HST 416 Indian History of the Southwest. (3)***once a year*

Reviews historical events from prehistoric peoples, the Spanish and Mexican periods, and the U.S. period from 1846 to present.

*General Studies: SB, C, H***HST 417 Topics in Mexican American History. (3)***once a year*

Focuses on specific topics in Mexican American history including immigration, civil rights, the Chicano Movement, union activism, and regional and generational differences.

*General Studies: SB, C, H***HST 423 The Tudor Monarchy. (3)***once a year*

Political, cultural, and social foundations of 16th-century England.

*General Studies: SB, H***HST 424 The Stuart Transformation of England. (3)***once a year*

Political, social, economic, and cultural developments in 17th-century England.

*General Studies: SB, H***HST 426 The British Empire. (3)***once a year*

British imperialism and colonialism in Africa, the Americas, Asia, and the South Pacific. Prerequisite: upper-division standing or instructor approval.

*General Studies: SB, H***HST 427 The French Revolution and the Napoleonic Era. (3)***once a year*

Conditions in Pre-Revolutionary and Revolutionary France; organization of France under Napoleon and impact of French changes upon Europe.

*General Studies: SB, H***HST 428 Modern France. (3)***not regularly offered*

Social, political, economic, and cultural transformations of French society, 1815–present. Impact of industrialization, war, and revolution on people's lives. Prerequisite: upper-division standing or instructor approval.

*General Studies: SB, G, H***HST 429 Modern Germany. (3)***once a year*

Germany since 1871.

*General Studies: SB, G, H***HST 430 Hitler: Man and Legend. (3)***once a year*

Biographical approach to the German Third Reich emphasizing nature of Nazi regime, sociocultural issues, World War II, and historiography.

*General Studies: SB, H***HST 431 Eastern Europe and the Balkans Before 1914. (3)***not regularly offered*

Empire and nation in Eastern Europe and the Balkans before World War I, emphasizing Hapsburg and Ottoman lands.

*General Studies: SB, H***HST 432 Eastern Europe and the Balkans in the 20th Century. (3)***not regularly offered*

Politics and culture in Eastern Europe and the Balkans from World War I to the present.

*General Studies: SB, G, H***HST 435 The Russian Empire. (3)***fall*

Development of Russian imperial institutions and civil society from the 17th to the early 20th centuries. Lecture, discussion.

*General Studies: SB, H***HST 436 The Soviet Experiment. (3)***spring*

Communist revolutionaries' rule of Russia, focusing on utopian culture, Stalinist terror, heroism in war, and the breakup of the U.S.S.R.

*General Studies: SB, G, H***HST 437 Spain Through the Golden Age. (3)***not regularly offered*

Cultural, economic, political, and social development of Spain from antiquity to the late 17th century.

*General Studies: HU/SB, H***HST 438 Modern Spain. (3)***not regularly offered*

Cultural, economic, political, and social development of modern Spain.

*General Studies: HU/SB, G, H***HST 441 Spanish South America. (3)***not regularly offered*

Political, economic, and social development of the Spanish-speaking nations of South America since independence. 19th-century developments.

*General Studies: SB, H***HST 442 Spanish South America. (3)***once a year*

Political, economic, and social development of the Spanish-speaking nations of South America. 20th-century developments.

*General Studies: SB, H***HST 443 The United States and Latin America. (3)***once a year*

Latin American struggle for diplomatic recognition, attempts at political union, participation in international organizations since 1810, and relations between the United States and Latin America.

General Studies: SB, G, H

HST 445 20th-Century Cuba. (3)*once a year*

History of Cuba from colonial era to formation of the early republic; political, economic, social development in late 20th century. Lecture, discussion.

General Studies: SB, G, H

HST 446 Colonial Mexico. (3)*once a year*

Political, economic, social, and cultural developments from pre-Columbian times to 1810.

General Studies: SB, H

HST 447 Modern Mexico. (3)*once a year*

Political, economic, social, and cultural developments from 1810 to the present.

General Studies: SB, H

HST 451 Chinese Cultural History. (3)*not regularly offered*

China's classics in translation studied both for their intrinsic ideas and for the origins of Chinese thought.

General Studies: SB, H

HST 452 Chinese Cultural History. (3)*not regularly offered*

Evolution of Confucian thought, its synthesis with Taoism and Buddhism, and modern reactions against, and uses of, Confucian traditions.

General Studies: SB, G, H

HST 453 The People's Republic of China. (3)*not regularly offered*

Analysis of major political, social, economic, and intellectual trends in China since the founding of the People's Republic in 1949.

General Studies: SB, G, H

HST 455 The United States and Japan. (3)*fall*

Cultural, political, and economic relations in the 19th and 20th centuries. Emphasis on post-World War II period.

General Studies: SB, G, H

HST 456 The Vietnam War. (3)*once a year*

Intersection of American and Asian histories in Vietnam, viewed from as many sides as possible.

General Studies: SB, G, H

HST 460 History of Fire. (3)*fall*

Global survey of the natural and cultural history of fire. Lecture, discussion.

General Studies: L, H

HST 480 Methods of Teaching History: Classroom Resources. (3)*fall*

Methods in instruction, organization, and presentation of the subject matter of history and closely allied fields. Prerequisites: HST 300; admission to PTPP.

HST 481 Methods of Teaching History: Community Resources. (3)*spring*

Identify community-based resources for teaching history, work with resources, and learn how to integrate them into the secondary classroom. Lecture, lab. Prerequisites: HST 300; admission to PTPP.

HST 484 Internship. (1–4)*not regularly offered***HST 492 Honors Directed Study. (1–6)***not regularly offered***HST 493 Honors Thesis. (3)***not regularly offered*

General Studies: L

HST 494 Special Topics. (1–4)*not regularly offered***HST 498 PS: History Pro-Seminar. (3)***fall and spring*

Required course for majors on topic selected by instructor; writing-intensive course related to the development of research skills and writing tools used by historians. Prerequisites: HST 300; History major.

General Studies: L

HST 499 Individualized Instruction. (1–3)*not regularly offered***HST 500 Methods of Historical Investigations. (1–12)***not regularly offered***HST 502 Public History Methodology. (3)***fall*

Introduction to historical research methodologies, techniques, and strategies used by public historians. Readings, short papers, and guest speakers. Required for students in the public history concentration.

HST 512 Western Civilization to the Enlightenment. (3)*fall*

Systematically examines various interpretations of Western civilization from the ancient Middle Eastern civilizations to the European Enlightenment. Seminar.

HST 513 Western Civilization Since the French Revolution. (3)*spring*

Systematically examines various interpretations of Western civilization since the French Revolution. Seminar.

HST 514 Historians of the United States. (3)*not regularly offered*

Study of the history of American historical writing from the early colonial days to the 20th century.

HST 515 Studies in Historiography. (3)*fall and spring*

Methods and theories of writers of history. May be repeated for credit.

HST 525 Historical Resource Management. (3)*fall*

Identification, documentation, and interpretation of historic period buildings, sites, and districts. Emphasis on interdisciplinary efforts among historians, architects, and anthropologists.

HST 526 Historians and Preservation. (3)*spring*

Preparation of historians for public and private historic preservation programs. Prerequisite: HST 525 or instructor approval.

HST 527 Historical Administration. (3)*fall*

Preparation of historians in administration of archives, historical sites, historical museums, historical societies, and historical offices in government agencies.

HST 532 Community History. (3)*not regularly offered*

Techniques and methods of community history emphasizing local resources. Required for community history option. Seminar.

HST 551 Comparative Histories of War and Revolution. (3)*once a year*

Comparative field course of the themes of war and revolution.

HST 552 Comparative History of Family and Community. (3)*not regularly offered*

Comparative course with a focus on family, including minority and ethnic groups, in society.

HST 553 Comparative History of State and Institutions. (3)*not regularly offered*

Comparative course that explores the changing nature of central institutions and government.

HST 554 Comparative Historical Population Studies: Ethnicity, Economy, and Migration. (3)*not regularly offered*

Comparative course that explores the impact of social, cultural, or economic changes in the population.

HST 555 Comparative Historical Topics. (3)*not regularly offered*

Analyzes a variety of specific social, political, cultural, and intellectual topics.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HST 584 Internship. (1–12)*not regularly offered***HST 590 Reading and Conference. (1–12)***not regularly offered***HST 591 Seminar. (3)***not regularly offered*

May be repeated for credit.

HST 592 Research. (1–12)*not regularly offered***HST 595 Continuing Registration. (1)***not regularly offered***HST 598 Special Topics. (1–4)***not regularly offered*

Reading courses designed to increase students' familiarity with a particular topic and the important writing concerning it. May be repeated for credit. Possible topics:

- (a) Asian History. (3)
- (b) English and British History. (3)
- (c) European History. (3)
- (d) Latin American History. (3)
- (e) U.S. History. (3)

HST 599 Thesis. (1–12)*not regularly offered***HST 684 Internship. (1–12)***not regularly offered***HST 690 Reading and Conference. (1–12)***not regularly offered***HST 695 Continuing Registration. (1)***not regularly offered***HST 700 Public History Research Methods. (1–12)***not regularly offered***HST 790 Reading and Conference. (1–12)***not regularly offered***HST 791 Seminar. (1–12)***not regularly offered***HST 792 Research. (1–12)***not regularly offered***HST 795 Continuing Registration. (1)***not regularly offered***HST 799 Dissertation. (1–15)***not regularly offered***SCHOLARLY PUBLISHING (PUB)**

See the *Graduate Catalog* for the PUB courses.

Interdisciplinary Humanities Program**Charles J. Dellheim***Director***(LL 641) 480/965-6747****www.asu.edu/clas/humanities****Humanities**

Professors: Dellheim, Kugelmass, Lehman;

Associate Professors: Privateer, Wright;

Assistant Professors: Baker, Ballew, Lund, Romeyn, Taylor;

Academic Professional: Garcia

Languages and Literatures

Regents' Professor: Foster

The humanities are those learned bodies of knowledge that are used to express ideas, to understand the meaning of words, and to explore the values and beliefs that underlie our culture and the cultures of others. As defined by the U.S.

Congress, the humanities include archaeology, comparative religion, ethics, history, jurisprudence, literature, linguistics, philosophy, the history and criticism of the arts, and those aspects of the social sciences that employ a philosophical or historical rather than quantitative approach to knowledge.

HUMANITIES—B.A.

The major in Humanities is interdisciplinary and may be intercollegiate. In consultation with an advisor, the student takes a minimum of 44 semester hours of interdisciplinary humanities courses from two components: (1) an interdisciplinary core of 23 hours and (2) an area of concentration of 21 hours.

Interdisciplinary Core*Issues, Methods, and Theory*HUM 200 Encountering the Humanities *HU*3HUM 498 Pro-Seminar in the Humanities *L/HU*3*Cultures in Context*HUM 301 Humanities in the Western World *L/HU, H*4HUM 302 Humanities in the Western World *L/HU, H*4

One approved upper-division HUM course on the cultures and traditions of Latin America, Asia, or Africa3

Ethnicity, Race, and Gender

One approved course.....3

Art, Science, and Technology

One approved course.....3

Total23

Area of Concentration

Required courses from list obtained from advisor.....21

Courses must be selected from an approved list or be approved in advance by the undergraduate advisor. Areas of study include architecture, culture, and society; classical studies; film studies; humanities; humanities and sciences; and liberal arts.

MINOR IN HUMANITIES

The following courses are required for the minor:

HUM 110 Contemporary Issues in the Humanities *HU*3HUM 301 Humanities in the Western World *L/HU, H*4HUM 302 Humanities in the Western World *L/HU, H*4

Three approved upper-division HUM courses9

Total20

GRADUATE PROGRAM

The faculty in the program also offer the M.A. degree in Humanities through the Graduate Committee on Humanities. See the *Graduate Catalog* for requirements.

HUMANITIES (HUM)**HUM 110 Contemporary Issues in Humanities. (3)***fall and spring*

Responses of literature, art history, history, philosophy, religion, and other disciplines to common problems affecting modern American life.

*General Studies: HU***HUM 194 Special Topics in the Humanities. (1–4)***not regularly offered*

Open to all students. Possible topics:

- (a) American Fine Arts. (3)
- (b) Comparative Fine and Performing Arts. (3)
- (c) Cultures of Ethnic Minorities. (3)
- (d) Non-Western Cultures. (3)
- (e) Western Historical or Contemporary Cultures. (3)

HUM 200 Encountering the Humanities. (3)*fall and spring*

Introduction to the languages, methods, and objectives of the study of the interdisciplinary humanities. Intersections of ideas, values, and cultural institutions. Lecture, studio, workshop. Prerequisite: Humanities major.

*General Studies: HU***HUM 260 Introduction to Islam. (3)***spring*

Examines Islamic beliefs, ceremonies, festivals, and institutions. Assumes no prior knowledge about Islam. Lecture, discussion. Cross-listed as REL 260. Credit is allowed for only HUM 260 or REL 260.

*General Studies: HU, G***HUM 294 Special Topics in the Humanities. (1–4)***not regularly offered*

Open to all students. Possible topics:

- (a) American Fine Arts. (3)
- (b) Comparative Fine and Performing Arts. (3)
- (c) Cultures of Ethnic Minorities. (3)
- (d) Film and Media Studies. (3)
- (e) Non-Western Cultures. (3)

HUM 301 Humanities in the Western World. (4)*fall*

Interrelation of arts and ideas in Western civilization, Hellenic through medieval. 3 hours lecture, 1 discussion meeting per week.

*General Studies: L/HU, H***HUM 302 Humanities in the Western World. (4)***spring*

Interrelation of arts and ideas in Western civilization, Renaissance to the present. 3 hours lecture, 1 discussion meeting per week.

*General Studies: L/HU, H***HUM 310 Japanese Cities and Cultures to 1800. (3)***once a year*

Relations among ideas and literary, visual, and performing arts of the ancient aristocracy, medieval samurai, and early modern townspeople. Cross-listed as REL 355. Credit is allowed for only HUM 310 or REL 355.

*General Studies: L/HU, H***HUM 312 Interpreting China's Classics. (3)***not regularly offered*

Study of selected Confucian and/or Taoist classics and ways they have been read in both Asian and Western scholarship. Cross-listed as HST 386. Credit is allowed for only HST 386 or HUM 312.

*General Studies: L/HU, H***HUM 331 Sexuality, Race, and Power. (3)***fall*

Sexuality as an expression of identity politics, social transgression, and racial inequality, as portrayed in international literature, art, and film. Lecture, discussion.

HUM 340 Contemporary American Film and Popular Culture. (3)*fall*

Study of American film, television, and popular music of past three decades as cultural documents.

*General Studies: HU***HUM 371 Origins, Evolution, and Creation. (3)***not regularly offered*

Examines scientific, mythic, and religious ideas relating to origins (particularly human). Place of antievolutionism and "scientific creationism" in American culture. Lecture, discussion. Cross-listed as BIO 344/HPS 311/REL 383. Credit is allowed for only BIO 344 or HPS 311 or HUM 371 or REL 383.

HUM 372 The Darwinian Revolution. (3)*not regularly offered*

Intellectual and cultural history of Darwinism and modern evolutionary theory and their impact on 19th- and 20th-century thought. Lecture, discussion. Cross-listed as BIO 346/HPS 332. Credit is allowed for only BIO 346 or HPS 332 or HUM 372.

HUM 394 Special Topics in the Humanities. (1–4)*not regularly offered*

Open to all students. Possible topics:

- (a) Art and Politics. (3)
- (b) Culture and Society of Contemporary China. (3)
- (c) Immigration and Ethnicity in American Culture. (3)
- (d) The Holocaust and Social Theory. (3)

HUM 401 The Culture and Legacy of the European Enlightenment. (3)*spring*

Historical survey of 18th-century European enlightenment and its status within contemporary intellectual culture. Lecture, discussion.

*General Studies: HU, H***HUM 420 Interpreting Latin America. (3)***spring*

Introduces protocols and methodologies for cultural interpretation of Latin America, with emphasis on four principal cities as cultural space.

*General Studies: HU, G, H***HUM 440 Los Angeles and Cultural Theory. (3)***spring*

Analyzes representations of Los Angeles in literary, film, and musical texts and broader implications for contemporary American society.

*General Studies: L/HU, C***HUM 441 American Jewry Through Film and TV. (3)***fall*

Examines the connection between Jews and the entertainment industry with reference to the constructions of race, class, and ethnicity. Lecture, discussion.

HUM 450 Technology and Culture. (3)*spring*

Explores sociocultural, ideological, and postmodern implications of technology and the role technology plays in social constructions as well as the spaces it creates. Seminar, discussion.

*General Studies: L/HU***HUM 451 Virtual Reality: The Culture of Cyberspace. (3)***once a year*

Socioeconomic, cultural, aesthetic, postmodern, theoretical, and human implications of virtual reality technologies. Themes: cultural ideological productions of cyberspace. Collaborative and research based.

HUM 460 Postmodern Culture and Interpretation. (3)*not regularly offered*

Currents and interpretations of postmodern culture; international, comparative perspective on the culture and traditions of contemporary "Europes" and "Americas." Seminar, discussion.

*General Studies: L***HUM 461 Postcolonial Studies. (3)***not regularly offered*

Interdisciplinary approach to the culture of European imperialism, independence movements, and contemporary postcolonial societies, focusing on literature, film, and theory. Lecture, discussion.

HUM 462 Psychoanalysis and Culture. (3)*fall*

Introduction to intellectual history of psychoanalytic movement of the 20th century and its contribution to humanities disciplines.

*General Studies: L/HU/SB***HUM 465 Narrative in the Human Sciences. (3)***fall*

Theories of narrative and narrativity in the humanities, concentrating on the problems of specific disciplines and interdisciplinary solutions.

*General Studies: L/HU***HUM 494 Special Topics in the Humanities. (1–4)***not regularly offered*

Open to all students. Possible topics:

- (a) Comedy and Culture. (3)
- (b) Global Media Studies. (3)
- (c) Italian/American Culture. (3)
- (d) Uses and Abuses of Classical Antiquity. (3)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HUM 498 Pro-Seminar in the Humanities. (1–7)*fall and spring*

Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. For students with a major in Humanities with upper-division standing. May be repeated for a total of 6 semester hours, when topics vary.

Possible topics:

(a) Theory and Culture. (3)

*General Studies: L/HU***HUM 501 Introduction to Cultural Theory. (3)***fall*

Selective history of cultural theory. Major figures and topics include Marx, Nietzsche, Freud, phenomenology, western Marxism, structuralism, and post-structuralism. Seminar.

HUM 503 Research and Writing in the Humanities. (3)*fall*

Systematic training in humanistic research and writing with particular attention to the interdisciplinary study of culture. Seminar.

HUM 511 Structures of Knowledge. (3)*fall*

Theories and examples of structures of knowledge, including such topics as metaphor, semiotics, and knowledge of the "other."

HUM 512 Writing Cultures. (3)*spring*

Theories and methods of representing Western and non-Western cultures in literature, history, ethnography, and pictorial media.

HUM 513 Interpretation of Cultures. (3)*once a year*

Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. May be repeated for a total of 6 semester hours, when topics vary.

HUM 549 Contemporary Critical Theory. (3)*once a year*

Advanced survey of major schools of 20th-century literary and critical theory. Lecture, discussion. Cross-listed as ENG 502. Credit is allowed for only ENG 502 or HUM 549.

HUM 591 Seminar. (1–12)*once a year*

Possible topics:

(a) Cultural Productions. (3)

(b) Theory and Culture. (3)

(c) Tragedy: Meaning and Form. (3)

HUM 598 Special Topics in the Humanities. (1–4)*not regularly offered*

Open to all students. Possible topics:

(a) Comparative Fine and Performing Arts. (3)

(b) Cultures of Ethnic Minorities. (3)

(c) Film and Media Studies. (3)

(d) Non-Western Cultures. (3)

(e) Western Historical or Contemporary Cultures. (3)

Department of Languages and Literatures

David William Foster

Chair

(LL 440) 480/965-6281

www.asu.edu/clas/dll

REGENTS' PROFESSORS

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COUCH, CROFT, CURRAN, EKMANIS, FLYS,
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COTA-CARDENAS, GARCIA-FERNANDEZ,
W. HENDRICKSON, HERNÁNDEZ-G., B. LAFFORD,
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DEAL, LE, OH, PANG

ASSOCIATE RESEARCH PROFESSIONAL

P. LAFFORD

ASSISTANT RESEARCH PROFESSIONAL

ORLICH

ACADEMIC ASSOCIATE

GLESSNER

BACHELOR OF ARTS DEGREE

The faculty in the Department of Languages and Literatures offer majors in Asian Languages (Chinese/Japanese), French, German, Italian, Russian, and Spanish. Each major consists of 45 semester hours, of which 30 must be in one language and 15 in a second language or in closely related fields to be approved by the advisor in consultation with the student. Of the 30 hours required for the major, a minimum of 24 hours must be taken at the 300 or 400 level and must include at least nine hours at the 400 level. Specific required courses for each major area are shown in this section and in a brochure available in the department. See "College Degree Requirements," page 319.

MAJORS**Asian Languages (Chinese/Japanese)—B.A.**

Students majoring in Asian Languages (Chinese/Japanese) may select a course of study that focuses on either language. The major requires 45 semester hours.

Chinese. At least nine semester hours must be at the 400 level. In addition to the courses shown below, the student must meet with an advisor and choose at least 15 semester hours of courses, including six semester hours of JPN courses such as Japanese language and calligraphy, Japanese literature in translation (FLA 421) or KOR prefix courses such as Korean language and/or Korean culture, and nine semester hours from appropriate courses in art, humanities, social and behavioral sciences, and business.

Required

CHI 313	Advanced Chinese <i>G</i>	3
CHI 314	Advanced Chinese <i>G</i>	3
CHI 321	Chinese Literature <i>L/HU</i>	3
CHI 322	Chinese Literature <i>L/HU, G</i>	3
	or FLA 420 Foreign Literature in Translation <i>HU, G</i> (3)	
CHI 413	Introduction to Classical Chinese <i>HU</i>	3
CHI 414	Introduction to Classical Chinese <i>HU</i>	3
Total	.....	18

Electives

Choose six semester hours from the courses below.....		6
CHI 309	Chinese Conversation (2)	
CHI 310	Chinese Conversation (2)	
CHI 311	Chinese Conversation (2)	
CHI 312	Chinese Conversation (2)	
CHI 494	Special Topics (1–4)	
CHI 499	Individualized Instruction (1–3)	
Total	6

Recommended

Two 200-level CHI courses (excluding 205).....	6
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Japanese. At least nine semester hours must be taken from FLA 421, and JPN 321 and 414. No more than eight semester hours may be selected from JPN 309, 310, 311, and 312.

Required

FLA 421	Japanese Literature in Translation <i>L/HU, G</i>	3
JPN 313	Advanced Japanese <i>G</i>	3
JPN 314	Advanced Japanese <i>G</i>	3
JPN 321	Japanese Literature <i>L/HU, G</i>	3
JPN 414	Introduction to Classical Japanese.....	3
Total	.....	15

Electives

Choose nine semester hours from the courses below.....		9
JPN 309	Intermediate Japanese Conversation (2)	
JPN 310	Intermediate Japanese Conversation (2)	
JPN 311	Japanese Conversation and Composition <i>G</i> (3)	
JPN 312	Japanese Conversation and Composition <i>G</i> (3)	
JPN 321	Japanese Literature (3) <i>L/HU, G</i>	
JPN 394	Special Topics (1–4)	
JPN 435	Advanced Readings (3)	
JPN 485	Problems of Translation (3)	
JPN 494	Special Topics (1–4)	

JPN 499 Individualized Instruction (1–3).....

Total.....9

Recommended

Two 200-level JPN courses (excluding 206).....6

In addition to the courses, the student must meet with an advisor and choose at least 15 semester hours of courses, including six semester hours of CHI prefix courses such as Chinese language and calligraphy, Chinese literature in translation (CHI 321 and 322 and FLA 420) or KOR prefix courses such as Korean language and/or Korean culture, and appropriate courses in art, humanities, social and behavioral sciences, and business.

French—B.A.**Required**

FRE 207	French for International Professions II.....	8
	or two 200-level FRE courses <i>G</i>	
FRE 311	French Conversation <i>G</i>	3
FRE 312	French Composition <i>G</i>	3
FRE 321	French Literature <i>L/HU, H</i>	3
FRE 322	French Literature <i>L/HU</i>	3
Total	.....	20

Select 12 semester hours from the following list, including at least nine semester hours from the 400 level:

FRE 315	French Phonetics.....	3
FRE 319	Business French <i>G</i>	3
FRE 411	Advanced Spoken French <i>G</i>	3
FRE 412	Advanced Written French <i>G</i>	3
FRE 415	French Civilization I <i>HU</i>	3
FRE 416	French Civilization II <i>HU, G</i>	3
FRE 422	Applied French Linguistics.....	3
FRE 423	French Syntax.....	3
FRE 441	French Literature of the 17th Century <i>HU</i>	3
FRE 442	French Literature of the 17th Century <i>HU, H</i>	3
FRE 445	French Literature of the 18th Century <i>L/HU</i>	3
FRE 451	French Poetry of the 19th Century.....	3
FRE 452	French Novel of the 19th Century <i>HU</i>	3
FRE 453	Theater of the 19th Century <i>L/HU</i>	3
FRE 461	Modern Narrative <i>HU</i>	3
FRE 462	Modern Poetry <i>HU</i>	3
FRE 471	The Literature of Francophone Africa and the Caribbean <i>L/HU</i>	3
FRE 472	Franco-Canadian Civilization.....	3
FRE 494	Special Topics.....	1–4
FRE 499	Individualized Instruction.....	1–3

In addition to the courses, the student must meet with an advisor and choose at least 15 semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other language courses.

German—B.A.**Required**

GER 311	German Conversation <i>G</i>	3
	or GER 312 German Conversation <i>G</i> (3)	
GER 313	German Composition <i>G</i>	3
GER 411	Advanced Grammar and Conversation <i>G</i>	3
GER 412	Advanced Grammar and Composition <i>G</i>	3
GER 421	German Literature <i>HU</i>	3
GER 422	German Literature <i>L/HU</i>	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Choose six semester hours from the courses below.....	6
GER 303 Scientific German (3)	
GER 304 Scientific German (3)	
GER 314 Introduction to German Literature (3)	
GER 319 Business Correspondence and Communication <i>G</i> (3)	
GER 394 Special Topics (1–4)	
GER 415 German Civilization <i>HU, H</i> (3)	
GER 416 German Civilization <i>HU, H</i> (3)	
GER 445 German Literature: Enlightenment to Classicism (3)	
GER 451 German Literature: Biedermeier to Naturalism (3)	
GER 494 Special Topics (1–4)	
Two 200-level GER courses.....	6
Total	30

In addition to the courses, the student must meet with an advisor and choose at least 15 semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other language courses.

Italian—B.A.

Required

ITA 311 Italian Composition and Conversation <i>G</i>	3
ITA 312 Italian Composition and Conversation <i>G</i>	3
ITA 325 Introduction to Italian Literature <i>HU</i>	3
Two 200-level ITA courses	6
Total	15

Note: ITA 394 Commercial Italian may substitute for either ITA 311 or 312.

Fifteen semester hours are required from the following list, including at least nine semester hours from the 400 level:

ITA 314 Advanced Italian <i>G</i>	3
ITA 394 Special Topics	1–4
ITA 415 Italian Civilization <i>L/HU, G</i>	3
ITA 420 Italian Cinema.....	3
ITA 430 Italian Literature of the Middle Ages <i>HU</i>	3
ITA 441 Dante: <i>Divina Commedia L/HU</i>	3
ITA 443 Italian Literature of the Renaissance <i>HU, H</i>	3
ITA 446 Italian Literature of the 18th and 19th Centuries <i>HU</i>	3
ITA 449 20th-Century Italian Literature <i>HU, G</i>	3
ITA 494 Special Topics	1–4
ITA 499 Individualized Instruction	1–3

In addition to the courses shown above, the student must meet with an advisor and choose at least 15 semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other language courses.

Russian—B.A.

Required

RUS 211 Basic Russian Conversation <i>G</i>	3
RUS 212 Basic Russian Conversation <i>G</i>	3
RUS 311 Russian Composition and Conversation <i>G</i>	3
RUS 312 Russian Composition and Conversation <i>G</i>	3
RUS 411 Advanced Composition and Conversation I <i>G</i>	3
or RUS 412 Advanced Composition and Conversation II <i>G</i> (3)	
Total	15

Fifteen semester hours are required from the following list, including at least six semester hours from the 400 level:

RUS 303 Scientific Russian.....	3
RUS 304 Scientific Russian.....	3
RUS 321 Survey of Russian Literature <i>L/HU, H</i>	3
RUS 322 Survey of Russian Literature <i>L/HU</i>	3
RUS 323 Survey of Literature of the Soviet Era <i>L/HU, G</i>	3
RUS 411 Advanced Composition and Conversation I <i>G</i>	3
RUS 412 Advanced Composition and Conversation II <i>G</i>	3
RUS 417 Applied Russian Phonetics	2
RUS 420 Russian Poetry <i>L/HU</i>	3
RUS 421 Pushkin <i>L/HU</i>	3
RUS 423 Dostoyevsky <i>L/HU</i>	3
RUS 424 Tolstoy <i>L/HU</i>	3
RUS 425 Chekhov <i>L/HU</i>	3
RUS 426 Literatures of the Nationalities of the Former Soviet Union <i>L/HU, G</i>	3
RUS 430 Russian Short Story <i>L/HU</i>	3
RUS 440 History of the Russian Language.....	3
RUS 441 Survey of Russian Culture <i>L/HU, G, H</i>	3
RUS 494 Special Topics	1–4
RUS 499 Individualized Instruction	1–3

In addition to the courses shown above, the student must meet with an advisor and choose at least 15 semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other language courses.

Spanish—B.A.

Required

SPA 313 Spanish Conversation and Composition <i>G</i>	3
or SPA 315 Spanish Conversation and Composition for Bilinguals (3)	
SPA 314 Spanish Conversation and Composition <i>G</i>	3
or SPA 316 Spanish Conversation and Composition for Bilinguals (3)	
SPA 325 Introduction to Hispanic Literature <i>HU</i>	3
SPA 412 Advanced Conversation and Composition <i>G</i>	3
SPA 425 Spanish Literature <i>HU</i>	3
Choose two courses below	6
SPA 426 Spanish Literature <i>HU</i> (3)	
SPA 427 Spanish American Literature <i>L</i> (3)	
SPA 428 Spanish American Literature <i>L, G</i> (3)	
Choose one course below.....	3
SPA 471 Civilization of the Spanish Southwest <i>HU</i> (3)	
SPA 472 Spanish American Civilization <i>HU, G, H</i> (3)	
SPA 473 Spanish Civilization <i>HU/SB, G</i> (3)	
Total	24

Electives

Two upper-division (300–400-level) SPA courses.....6

Related Fields

POR 101 Elementary Portuguese	5
POR 201 Intermediate Portuguese <i>G</i>	5

In addition to these courses, the student must meet with an advisor and choose at least six semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other romance language courses.

SPA 311 and 312 are not counted toward the major or minor in Spanish.

MINORS

Each minor in Asian Languages (Chinese/Japanese), French, German, Italian, Russian, and Spanish consists of 18 hours, of which 12 hours must be in the upper division. In addition, specific required courses for each area follow and are in a brochure in the department.

Chinese**Required**

CHI 313	Advanced Chinese <i>G</i>	3
CHI 314	Advanced Chinese <i>G</i>	3

Consult with the departmental advisor for other courses.

French**Required**

FRE 311	French Conversation <i>G</i>	3
FRE 312	French Composition <i>G</i>	3
FRE 321	French Literature <i>L/HU, H</i>	3
	or FRE 322 French Literature <i>L/HU</i> (3)	

Consult with the departmental advisor for other courses.
Twelve hours must be at the 300 level or above.

German**Required**

GER 311	German Conversation <i>G</i>	3
	or GER 312 German Conversation <i>G</i> (3)	
GER 313	German Composition <i>G</i>	3
	One 400-level GER course.....	3
	Upper-division GER course.....	3

Consult with the departmental advisor for other courses.

Italian**Required**

ITA 311	Italian Composition and Conversation <i>G</i>	3
	or ITA 312 Italian Composition and Conversation <i>G</i> (3)	
ITA 325	Introduction to Italian Literature <i>HU</i>	3
	One 400-level ITA course.....	3

Consult with the departmental advisor for other courses.

Japanese**Required**

JPN 313	Advanced Japanese <i>G</i>	3
JPN 314	Advanced Japanese <i>G</i>	3

Consult with the departmental advisor for other courses.

Russian**Required**

RUS 303	Scientific Russian.....	3
RUS 304	Scientific Russian.....	3
RUS 311	Russian Composition and Conversation <i>G</i>	3
RUS 312	Russian Composition and Conversation <i>G</i>	3

RUS 211 and 212 are the only lower-division courses that may count toward the Russian minor.

Consult with the departmental advisor for other courses.

Spanish

The minor in Spanish requires a minimum of 18 upper-division semester hours.

Required

SPA 313	Spanish Conversation and Composition <i>G</i>	3
	or SPA 315 Spanish Conversation and Composition for Bilinguals (3)	
SPA 314	Spanish Conversation and Composition <i>G</i>	3
	or SPA 316 Spanish Conversation and Composition for Bilinguals (3)	
SPA 325	Introduction to Hispanic Literature <i>HU</i>	3
SPA 413	Advanced Spanish Grammar <i>G</i>	3
SPA 471	Civilization of the Spanish Southwest <i>HU</i>	3
	or SPA 472 Spanish American Civilization <i>HU, G, H</i> (3)	
	or SPA 473 Spanish Civilization <i>HU/SB, G</i> (3)	

SPA 311 and 312 are not counted toward the major or minor in Spanish.

CERTIFICATES AND EMPHASES

The following are certificate programs or emphases offered in the Department of Languages and Literatures. For more information, see "Certificate Programs and Areas of Emphasis," page 324.

Asian Studies Certificate. Foreign language students majoring in Asian Languages (Chinese/Japanese) may elect to pursue an Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content.

Latin American Studies Certificate. Foreign language students majoring in Spanish may elect to pursue a Latin American Studies Certificate combining courses from the major with selected outside courses of wholly Latin American content.

Russian and East European Studies Certificate. Any undergraduate major can earn a Russian and East European Studies Certificate by successfully completing one of the options mentioned in the section on "Russian and East European Studies," page 326.

Scandinavian Studies Certificate. Any undergraduate major can earn a Scandinavian Studies Certificate.

Southeast Asian Studies Certificate. To earn a Southeast Asian Studies Certificate, a student must complete a minimum of 40 semester hours of course work related to Southeast Asia, including two years (20 semester hours) of a Southeast Asian language.

Translation Certificate (Spanish/English). The Translation Certificate program is designed to provide the advanced training required for professional translation in both public and private sectors, preparation for the rigorous examinations required by national and international agencies, and training as an ancillary skill for professional fields, such as international business, public health and medicine, and law, in accordance with guidelines recommended by the American Translators' Association. The certificate is a nondegree program consisting of 12 semester hours of course work and two hours of in-service practicum primarily into the receptor language of English from the source language of Spanish. It may be taken simultaneously with course work leading to an undergraduate or graduate degree, as a

related area sequence, or as the sole program of study for members of the community who meet the admission requirements of the certificate program and are enrolled in the university. A complete brochure is available at the Department of Languages and Literatures in LL 440.

While the certificate program is not yet available in French, FRE translation courses may be available. See the *Schedule of Classes* for course offerings.

Admission Requirements. Since entrance to professional translation is through work, cultural experience, and examination, the two entrance requirements to this certificate program are (1) written proficiency examination in the source and the receptor languages at the level of completion of the fourth year or most advanced composition course in Spanish, which at ASU is SPA 412, and (2) either an academic year at a university in a Spanish-speaking country, an extensive work experience using Spanish, or demonstrated bilingual facility, both written and oral, in English and Spanish.

Certificate Requirements. The certificate program consists of the following requirements:

Prerequisites

FLA 400	Linguistics <i>SB</i>	3
	or SPA 494 <i>ST</i> : Introduction to Hispanic Linguistics (3) or equivalent	
SPA 413	Advanced Spanish Grammar <i>G</i>	3
SPA 494	<i>ST</i> : Lexicography	3

Required

FLA 401	Translation Theory and Practice	3
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In-Service Practicum

FLA 484	Internship	2
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Also required are nine hours of applied translation electives in specialized areas chosen from the following courses:

FLA 481	Technical and Scientific Translation	3
FLA 482	Business and Financial Translation.....	3
FLA 483	Medical and Legal Translation.....	3
FLA 485	Problems of Literary Translation	3

B.I.S. CONCENTRATION AREAS

Students seeking to focus on a language as one of their concentration areas for the Bachelor of Interdisciplinary Studies degree may choose from Chinese, French, German, Italian, Japanese, Russian, and Spanish. They may also choose from any of the approved certificate programs. The requirements for the Bachelor of Arts in Interdisciplinary Studies (B.I.S.) concentrations are the same for the minor in that language. See “Minors,” page 386, for specific course requirements. For more information, see “Division of Undergraduate Academic Services,” page 107.

SECONDARY EDUCATION—B.A.E.

French, German, Japanese, and Spanish. Each of the major teaching fields in French, German, Japanese, and Spanish consists of 45 semester hours, of which 30 must be in one language and 15 in a second language or in closely related fields to be approved by the advisor in consultation with the student. Of the 30 hours required for the academic specialization, a minimum of 24 hours must be taken at the 300 or 400 level and must include at least nine hours at the

400 level. Specific required courses for each major area are listed in curriculum check sheets of the individual language areas available in the department.

Applications are not being accepted at this time for Chinese and Russian.

GRADUATE PROGRAMS

The faculty in the Department of Languages and Literatures offer programs leading to the M.A. degree in French, German, and Spanish and the Ph.D. degree in Spanish. See the *Graduate Catalog* for requirements.

FOREIGN LANGUAGES FOR INTERNATIONAL PROFESSIONS

The sequence of two semesters, listed under numbers 107 and 207 in two languages (French and Spanish), integrates an accelerated study, a functional approach to course design, and preparation for international professions (e.g., business, diplomacy, international political economy). It is parallel to the traditional sequence of 101 through 202 and also satisfies the college’s foreign language requirement. The sequence differs from traditional basic language programs in that all aspects of the language—vocabulary, grammar, and skill development—are practiced within the context of authentic communication for social and professional purposes in the target culture. Classes meet eight hours weekly, for eight semester hours in each of two semesters.

Students who have had success in learning one foreign language are encouraged to join this program in a second language. Students should contact the Department of Languages and Literatures before registration.

FOREIGN LANGUAGE REQUIREMENT

The College of Liberal Arts and Sciences requires knowledge of one foreign language equivalent to the completion of two years’ study at the college level. This normally includes a sequence of courses numbered 101 and 102 and 201 and 202 *or* 107 and 207. However, important exceptions exist in Greek, Latin, Portuguese, and Romanian.

Greek. To satisfy the foreign language requirement, students must take GRK 301 and 302.

Latin. Students entering LAT 202 directly from LAT 102 must complete LAT 201 to satisfy the College of Liberal Arts and Sciences requirement.

Portuguese. To satisfy the foreign language requirement, students must take POR 314 or a higher numbered POR course.

Romanian. To satisfy the foreign language requirement, students must complete ROM 314.

FOREIGN LANGUAGE PLACEMENT

Students who transfer from other postsecondary institutions with foreign language credits below the 202 level are placed in a course at the level directly above the work completed.

Students who have completed their secondary education at a school in which the language of instruction was not English are considered to have satisfied the foreign language requirement. Certification of this status is made at the

time of admission to ASU. Questions should be addressed to the foreign credentials evaluator at Undergraduate Admissions.

The foreign language requirement can be met in languages not taught at ASU either by transferring credit from another institution or by passing a proficiency examination. When possible, the Department of Languages and Literatures recommends to the college an appropriate source for such examinations and proctors them. Grading is done by the institution that provides the examination, and the student pays any costs incurred. The examination can be used only to demonstrate proficiency; it does not produce semester hours of credit.

Students desiring placement above the 101-level course in French, German, or Spanish should take the placement exam for that language in the Computer Language Laboratory in LL 65.

Ordinarily, no placement or proficiency examination is administered to students who wish to continue studying languages for which high school credits have been earned. Students should be guided by the following principles of equivalency: (1) one unit (one academic year) of high school-level study is considered, for placement purposes only, to equal one semester of study of the same language at the university level. Thus, students with one year of high school study would enroll in the second semester course (102); students with two years of high school study, in the third semester course (201), and so on. (2) Students who feel that their high school language preparation was inadequate may choose to place themselves in a lower level, but not lower than 111 with two or three years of high school study and 201 with four years of high school study.

Students with prior knowledge of a language may meet the college foreign language requirement in any one of the following ways:

1. by satisfactory results in a nonrepeatable college-approved proficiency examination;
2. by achieving a grade of at least "C" in the last course of the required sequence; or
3. by achieving a grade of at least "C" in a course taught in the language for which the last course of the required sequence is a prerequisite.

Students are expected to follow the progressive sequence of 100, 200, and 300. Once a grade of "C" or higher is earned in a 300-level class in a language, students may not earn lower-division credit in that language.

First-year foreign language courses taught by the Department of Languages and Literatures are not open to students who have spent one or more years in a country where that language is the predominant language. Individual language areas may have different policies. Students with questions about this policy should check with the appropriate language coordinator in the department.

If transfer students are uncertain about course equivalencies, they should contact the Department of Languages and Literatures.

LANGUAGE LABORATORY REQUIREMENT

All students enrolled in 101, 102, 201, and 202 language courses are expected to spend a minimum of one hour per week in the language laboratory or in other assigned audio-lingual tape exercises in addition to the regular class periods.

FOREIGN LANGUAGES (FLA)

FLA 150 Introduction to East Asian Culture. (3)

spring

Introduction to the cultures of China, Japan, and Korea.

General Studies: HU, G

FLA 323 Survey of Literature of the Soviet Era in Translation. (3)

fall and spring

Surveys main literary movements, prominent authors, most significant works of prose, poetry, and drama of the Soviet period, 1917–1991.

General Studies: L/HU, G

FLA 400 Linguistics. (3)

spring

Introduction to the analysis of language and its use in social contexts.

Topics: morphology, phonology, pragmatics, semantics, syntax, and variation. Prerequisites: junior standing; instructor approval.

General Studies: SB

FLA 401 Translation Theory and Practice. (3)

not regularly offered

Translation theories and professional practices and ethics; bibliography, computer technology, and sample texts for natural and social sciences and humanities. Prerequisite: 4th-year composition or instructor approval in respective language area.

FLA 415 Bilingualism and Languages in Contact. (3)

fall

Analysis of linguistic aspects of bilingualism, e.g., pidgins and creoles, code-switching, and other contact phenomena; simultaneous/sequential bilingual language acquisition. Prerequisite: FLA 400 (or its equivalent) or instructor approval.

FLA 420 Foreign Literature in Translation. (3)

fall and spring

Not for language majors (except in Asian languages and Russian); open to language majors as a related-area course. Graduate students by permission. Possible topics:

- (a) Brazilian
 - (b) Chinese
 - (c) French
 - (d) German
 - (e) Greek
 - (f) Italian
 - (g) Latin
 - (h) Portuguese
 - (i) Russian
 - (j) Soviet
 - (k) Spanish
 - (l) Spanish American
- General Studies: HU, G*

FLA 421 Japanese Literature in Translation. (3)

fall and spring

Readings selected by theme or genre or period from various works of Japanese literature in English translation. May be repeated when topics vary. Graduate students by permission. Prerequisite: General Studies L course.

General Studies: L/HU, G

FLA 480 Methods of Teaching Foreign Languages. (3)

fall

Teaching foreign languages and literatures at secondary and college levels. Does not meet the Liberal Arts and Sciences General Studies requirement for humanities and fine arts. Required for admission to SED 478. Prerequisite: 12 hours of upper-division courses in 1 foreign language.

FLA 481 Technical and Scientific Translation. (3)*not regularly offered*

Resources, practices, strategies, and lexicon for translation of professional texts in subjects such as engineering, architecture, agriculture, computer technology, electronics, and physical and biological sciences. Prerequisite: FLA 401.

FLA 482 Business and Financial Translation. (3)*not regularly offered*

Resources, practices, strategies, and lexicon for translation of professional texts in subjects such as economics, finance, insurance, management, marketing, accounting, advertising, and real estate. Prerequisite: FLA 401.

FLA 483 Medical and Legal Translation. (3)*not regularly offered*

Resources and strategies for translation of professional texts in subjects such as medicine, nursing, public health, criminal justice, and international law. May be repeated for a total of 6 semester hours. Prerequisite: FLA 401.

FLA 484 Internship. (1–12)*not regularly offered***FLA 485 Problems of Literary Translation. (3)***not regularly offered*

Theory and practice with emphasis on application through individual translation projects. May be repeated for a total of 6 semester hours. Prerequisite: FLA 401 or instructor approval in the respective language area.

FLA 494 Special Topics. (1–4)*not regularly offered*

Various topics.

FLA 515 Second Language Acquisition. (3)*spring*

Discussion and application of theories of second language acquisition. Prerequisite: FLA 400 (or its equivalent).

FLA 525 Trends and Issues in Foreign Language Teaching. (3)*not regularly offered*

Advanced methods seminar, designed for experienced teachers.

ARABIC (ARB)**ARB 101 Elementary Arabic. (4)***fall*

Reading, writing, speaking, and understanding basic Arabic. 4 hours lecture, 1 hour lab.

ARB 102 Elementary Arabic. (4)*spring*

Reading, writing, speaking, and understanding basic Arabic. 4 hours lecture, 1 hour lab. Prerequisite: ARB 101 (or its equivalent).

ARB 201 Intermediate Arabic. (4)*fall*

Review of Arabic grammar with emphasis on the development of the skills of listening comprehension, reading, speaking, and writing. 4 hours lecture, 1 hour lab. Prerequisite: ARB 102 (or its equivalent).
General Studies: G

ARB 202 Intermediate Arabic. (4)*spring*

Review of Arabic grammar with emphasis on the development of the skills of listening comprehension, reading, speaking, and writing. 4 hours lecture, 1 hour lab. Prerequisite: ARB 201 (or its equivalent).
General Studies: G

CHINESE (CHI)**CHI 101 Elementary Chinese. (5)***fall*

Pronunciation, grammar, elementary conversation, and development of basic reading and writing skills. Standard dialect. 5 class hours. Fee.

CHI 102 Elementary Chinese. (5)*spring*

See CHI 101. Fee. Prerequisite: CHI 101 (or its equivalent).

CHI 107 Chinese for International Professions I. (10)*fall*

Accelerated program alternative to CHI 101, 102 sequence. Functional approach to needs of international professions. 10 class hours. Fee.

CHI 201 Intermediate Chinese. (5)*fall*

Systematic review of grammar. Development of vocabulary through reading and writing. Drill in aural/oral skills. 5 class hours. Prerequisite: CHI 102 (or its equivalent).

*General Studies: G***CHI 202 Intermediate Chinese. (5)***spring*

See CHI 201. Prerequisite: CHI 201 (or its equivalent).

*General Studies: G***CHI 205 Chinese Calligraphy. (1)***fall and spring*

Introduction to styles and techniques of Chinese writing. Knowledge of Chinese or Japanese is not required.

CHI 207 Chinese for International Professions II. (10)*spring*

Continuation of CHI 107, alternative to CHI 201, 202 sequence.

Expansion of communicative proficiency in specific areas of international professions. 10 class hours. Prerequisite: CHI 107 or instructor approval.

*General Studies: G***CHI 309 Chinese Conversation. (2)***fall*

Aural/oral drills using contemporary stories, articles, and essays. For students with lower-level proficiency. Prerequisite: CHI 202.

CHI 310 Chinese Conversation. (2)*spring*

See CHI 309. Prerequisite: CHI 202.

CHI 311 Chinese Conversation. (2)*fall*

Intensive aural/oral practice in modern Chinese. For students who have lived in China or a Chinese-speaking environment. Discussion, drill. Prerequisite: CHI 202.

CHI 312 Chinese Conversation. (2)*spring*

See CHI 311. Discussion, drill. Prerequisite: CHI 202.

CHI 313 Advanced Chinese. (3)*fall*

Modern language in general or specific areas depending on the student's needs or interests. 3 hours lecture, arranged lab. Prerequisite: CHI 202 (or its equivalent).

*General Studies: G***CHI 314 Advanced Chinese. (3)***spring*

Continuation of CHI 313. Prerequisite: CHI 313.

*General Studies: G***CHI 321 Chinese Literature. (3)***fall*

Masterworks of the tradition from the 6th century B.C.E. through the 13th century. Readings, lectures, and examinations are in English.

*General Studies: L/HU***CHI 322 Chinese Literature. (3)***spring*

Masterpieces from the later tradition and its transition to modern times. Readings, lectures, and examinations are in English.

*General Studies: L/HU, G***CHI 413 Introduction to Classical Chinese. (3)***fall*

Reading in various genres of pre-20th century literature (wen-yen), with analysis of the structure of the classical writings. Prerequisite: CHI 314 or instructor approval.

*General Studies: HU***CHI 414 Introduction to Classical Chinese. (3)***spring*

Continuation of CHI 413. Prerequisite: CHI 413.

*General Studies: HU***CHI 494 Special Topics. (1–4)***not regularly offered***CHI 499 Individualized Instruction. (1–3)***not regularly offered***CHI 500 Bibliography and Research Methods. (3)***not regularly offered*

Introduction to research materials on China in Chinese, Japanese, and Western languages. Overview of research methods. Lecture, discussion.

CHI 514 Advanced Classical Chinese. (3)*not regularly offered*

Close readings in selected premodern texts, with focus on special grammatical features, and increased vocabulary. Lecture, discussion.

CHI 520 Teaching of Chinese as a Second Language. (3)*not regularly offered*

Theory and practice of teaching Chinese, including presentation, interaction, and evaluation, with consideration given to cultural factors. Lecture, discussion.

CHI 535 Advanced Readings. (3)*not regularly offered*

Readings in primary and secondary sources in history, art, religious studies, economics, or other fields. Lecture, discussion.

CHI 543 Chinese Language and Linguistics. (3)*fall*

Analysis and discussion, within the framework of linguistic theory, of selected problems in Chinese phonetics, morphology, and syntax. Lecture, discussion.

CHI 585 Problems of Translation. (3)*not regularly offered*

Theories and practice of translation: strategies for handling a variety of Chinese texts. Lecture, discussion.

CHI 591 Seminar. (3)*not regularly offered*

Topics in literary, linguistic, or cultural studies.

FRENCH (FRE)**FRE 101 Elementary French. (4)***fall, spring, summer*

Intensive aural/oral drill in class and laboratory; basic grammar supplemented by simple prose readings. Not open to students with credit for FRE 111. 4 hours lecture, 1 hour lab. Fee.

FRE 102 Elementary French. (4)*fall, spring, summer*

See FRE 101. Fee. Prerequisite: FRE 101 (or its equivalent).

FRE 107 French for International Professions I. (8)*fall*

Accelerated alternative to FRE 101 and 102 or FRE 111. Functional approach. Emphasis on communicative competence for international professions. Fee.

FRE 111 Fundamentals of French. (4)*fall and spring*

Primarily for students with two years of high school French who need review to enter second year study. Not open to students with credit for FRE 101 or 102 or 107. 4 hours lecture, 1 hour lab. Fee.

FRE 201 Intermediate French I. (4)*fall, spring, summer*

Grammar review, with emphasis on development of skills of speaking, reading, writing, and listening comprehension. 4 hours lecture; 1 hour lab. Fee. Prerequisite: FRE 102 or 111 (or its equivalent).

*General Studies: G***FRE 202 Intermediate French II. (4)***fall, spring, summer*

Continuation of grammar review with emphasis on development of skills in speaking, reading, writing, and listening comprehension. 4 hours lecture, 1 hour lab. Fee. Prerequisite: FRE 201 (or its equivalent).

*General Studies: G***FRE 205 Readings in French Literature. (3)***fall, spring, summer*

Designed to teach reading with facility and comprehension. Vocabulary building and textual analysis of literary genres are major elements. Prerequisite: FRE 202 (or its equivalent).

*General Studies: G***FRE 207 French for International Professions II. (8)***spring*

Continuation of FRE 107, alternative to FRE 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Fee. Prerequisite: FRE 107 or instructor approval.

*General Studies: G***FRE 311 French Conversation. (3)***fall and spring*

Further practice in speaking French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: 8 hours of 200-level French (or its equivalent).

*General Studies: G***FRE 312 French Composition. (3)***fall and spring*

Further practice in writing French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: 8 hours of 200-level French (or its equivalent).

*General Studies: G***FRE 315 French Phonetics. (3)***fall*

Practice and theory of French pronunciation. Emphasis on standard French, although an overview of regional varieties is offered. Lecture and lab. Prerequisite: FRE 311 (or its equivalent).

FRE 319 Business French. (3)*spring*

Introduction to the structure, vocabulary, and practices of the French business world. Prerequisite: FRE 312 or instructor approval.

*General Studies: G***FRE 321 French Literature. (3)***fall and spring*

Representative masterpieces and significant movements of French literature of the Middle Ages through the 18th century. Prerequisite: FRE 205 (or its equivalent).

*General Studies: L/HU, H***FRE 322 French Literature. (3)***fall and spring*

Literature of the 19th and 20th centuries. Prerequisite: FRE 205 (or its equivalent).

*General Studies: L/HU***FRE 411 Advanced Spoken French. (3)***fall and spring*

Improvement of spoken French. Prerequisites: FRE 311 and 6 hours of 300-level French (or their equivalents).

*General Studies: G***FRE 412 Advanced Written French. (3)***fall and spring*

Improvement of composition skills. Prerequisites: FRE 312 and 6 hours of 300-level French (or their equivalents).

*General Studies: G***FRE 415 French Civilization I. (3)***fall*

Political, intellectual, social, economic, and artistic development of France from its origins to the end of the 17th century. Prerequisite: 6 hours of upper-division French.

*General Studies: HU***FRE 416 French Civilization II. (3)***spring*

Political, intellectual, social, economic, and artistic development of France from the 18th century to present. Prerequisite: 6 hours of upper-division French.

*General Studies: HU, G***FRE 421 Structure of French. (3)***fall*

Phonology, morphology, syntax, semantics, and varieties of French. Prerequisites: both FRE 311 and 312 or only instructor approval.

FRE 422 Applied French Linguistics. (3)*spring*

Applies linguistic theory and second language acquisition theory to teaching of French. Prerequisite: ASB 480 or ENG 213 or FLA 400.

FRE 423 French Syntax. (3)*fall*

Analysis of French syntactic structure by contemporary theoretical models. Prerequisite: ASB 480 or ENG 213 or FLA 400.

FRE 424 French Phonology. (3)*spring*

Introduction to phonological theory and its application to French. Prerequisites: both FRE 311 and 312 or only instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

FRE 441 French Literature of the 17th Century. (3)*not regularly offered*

From 1600 to 1660. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.

*General Studies: HU***FRE 442 French Literature of the 17th Century. (3)***not regularly offered*

From 1660 to 1700. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.

*General Studies: HU, H***FRE 445 French Literature of the 18th Century. (3)***not regularly offered*

Contributions of the philosophers and the development of the novel and drama. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.

*General Studies: L/HU***FRE 451 French Poetry of the 19th Century. (3)***not regularly offered*

From Romanticism to Parnassian poetry to Symbolism. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.

FRE 452 French Novel of the 19th Century. (3)*not regularly offered*

From Constant, Hugo, Balzac, Stendhal, and Sand to Flaubert and Zola, with emphasis on major literary movements. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.

*General Studies: HU***FRE 453 Theater of the 19th Century. (3)***not regularly offered*

From Romantic drama to the Symbolist Theater. Representative plays of Hugo, Musset, Vigny, Dumas, Becque, Rostand, Feydeau, and Mirbeau. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.

*General Studies: L/HU***FRE 461 Modern Narrative. (3)***fall*

Representative authors from Gide to the new Nouveau Roman. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.

*General Studies: HU***FRE 462 Modern Poetry. (3)***spring*

Representative authors from Mallarmé to Bonnefoy. Lecture, discussion. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.

*General Studies: HU***FRE 471 The Literature of Francophone Africa and the Caribbean. (3)***not regularly offered*

Selected prose, poetry, and drama of black authors from Africa and the Caribbean. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.

*General Studies: L/HU***FRE 472 Franco-Canadian Civilization. (3)***spring*

Study of the civilization of Quebec in particular through its history, language, literature, music, and customs. Prerequisite: 9 hours of 300-level French or instructor approval.

FRE 494 Special Topics. (1–4)*not regularly offered***FRE 499 Individualized Instruction. (1–3)***not regularly offered***FRE 500 Bibliography and Research Methods. (3)***fall*

Required of all graduate students.

FRE 510 Explication de Textes. (3)*not regularly offered*

Detailed analysis of literary texts.

FRE 515 Intellectual Currents in France, from the Middle Ages to the 18th Century. (3)*not regularly offered*

Significant social, aesthetic, philosophic, and scientific ideas as presented by major writers of fiction and nonfiction.

FRE 516 Intellectual Currents in France, from the 19th Century to the 20th Century. (3)*not regularly offered*

See FRE 515.

FRE 521 History of the French Language. (3)*not regularly offered*

Principal phonological, morphological, and semantic developments of French from Latin to present, with emphasis on Old and Middle French. Some familiarity with Latin is recommended.

FRE 531 Medieval French Literature. (3)*fall*

Readings in the epics, early drama, roman courtois, and other representative literary genres of the Middle Ages.

FRE 535 French Literature of the 16th Century. (3)*spring*

Readings in French Renaissance literature with special attention to the humanist movement and to Rabelais, Montaigne, and the Pleiade.

FRE 591 Seminar. (1–12)*not regularly offered*

Possible topics:

- (a) Advanced Problems in French Literature. (3)
- (b) Balzac. (3)
- (c) Corneille, Molière, and Racine. (3)
- (d) Diderot, Voltaire, and Rousseau. (3)
- (e) Flaubert. (3)
- (f) French Existentialist Literature. (3)
- (g) French Literary Criticism. (3)
- (h) Proust. (3)
- (i) Realism and Naturalism. (3)
- (j) Romanticism. (3)
- (k) Stendhal and Zola. (3)

GERMAN (GER)**GER 101 Elementary German. (4)***fall, spring, summer*

Reading, writing, speaking, and understanding of basic German, with emphasis on pronunciation and grammar. Credit is allowed for only GER 101 or 111. 4 hours lecture, 1 hour lab. Fee.

GER 102 Elementary German. (4)*fall, spring, summer*

See GER 101. Credit is allowed for only GER 102 or 111. Fee. Prerequisite: GER 101 (or its equivalent).

GER 111 Fundamentals of German. (4)*fall and spring*

Primarily for students with two years of high school German who need review to enter second-year study. Credit is allowed for only GER 111 or both GER 101 and 102. 4 hours lecture, 1 hour lab. Fee.

GER 201 Intermediate German. (4)*fall, spring, summer*

Intensive review of grammar, with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: GER 102 or 111 (or its equivalent).

*General Studies: G***GER 202 Intermediate German. (4)***fall, spring, summer*

See GER 201. Fee. Prerequisite: GER 201 (or its equivalent).

*General Studies: G***GER 303 Scientific German. (3)***not regularly offered*

Acquisition of a specialized vocabulary through the reading of German scientific publications. Prerequisite: GER 202 (or its equivalent).

GER 304 Scientific German. (3)*not regularly offered*

See GER 303. Prerequisite: GER 202 (or its equivalent).

GER 311 German Conversation. (3)*fall*

Expansion of idiom through oral practice dealing with contemporary articles, essays, and stories. 3 semester hours limit for majors. Prerequisite: GER 202 (or its equivalent).

*General Studies: G***GER 312 German Conversation. (3)***spring*

See GER 311. Prerequisite: GER 202 (or its equivalent).

General Studies: G

GER 313 German Composition. (3)*spring*

Intensive practice in writing, emphasizing style and grammar. Prerequisite: GER 202 (or its equivalent).

*General Studies: G***GER 314 Introduction to German Literature. (3)***fall*Beginning study of German poetry, drama, the novel, and the *Novelle*. Prerequisite: GER 202 (or its equivalent).**GER 319 Business Correspondence and Communication. (3)***not regularly offered*

Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: GER 313 or instructor approval.

*General Studies: G***GER 394 Special Topics. (1–4)***not regularly offered***GER 411 Advanced Grammar and Conversation. (3)***fall*

Improvement of diction and idiom through intensive oral review. Prerequisite: GER 311 or 312 (or its equivalent).

*General Studies: G***GER 412 Advanced Grammar and Composition. (3)***spring*

Improvement of writing ability. Prerequisite: GER 313 (or its equivalent).

*General Studies: G***GER 415 German Civilization. (3)***spring*

Aspects of political, social, and cultural life of the German-speaking world from the beginning through 1600. Prerequisite: any 300-level German course or instructor approval.

*General Studies: HU, H***GER 416 German Civilization. (3)***fall*

From 1600 through 1945. Prerequisite: any 300-level German course or instructor approval.

*General Studies: HU, H***GER 421 German Literature. (3)***fall*

From the beginning to Classicism. Prerequisite: 6 hours of 300-level German.

*General Studies: HU***GER 422 German Literature. (3)***spring*

From Romanticism to the present. Prerequisite: 6 hours of 300-level German.

*General Studies: L/HU***GER 445 German Literature: Enlightenment to Classicism. (3)***not regularly offered*

Major works of the literary epochs in the century. Prerequisite: GER 421 or instructor approval.

GER 451 German Literature: Biedermeier to Naturalism. (3)*not regularly offered*

Representative works of prose and poetry from 1820 to 1890. Prerequisite: GER 422 or instructor approval.

GER 453 German Literary Masterpieces on Film. (3)*fall, spring, summer*

Film and literature in their correlation to each other and to cultural, political, and social trends in German-speaking countries. Special arrangements for graduate students and those without a knowledge of German. Lecture, discussion.

*General Studies: HU, G, H***GER 461 Contemporary German Literature. (3)***spring and summer*

German writers since 1945. Prerequisite: GER 422 or instructor approval.

GER 494 Special Topics. (1–4)*not regularly offered***GER 500 Bibliography and Research Methods. (3)***not regularly offered*

Required of all graduate students.

GER 511 German Stylistics. (3)*not regularly offered*

Art of writing literary German, comparative stylistics.

GER 521 History of German Language. (3)*not regularly offered*

Linguistic development of German from the earliest records to the present.

GER 523 German Drama. (3)*not regularly offered*

Drama of the 19th and 20th centuries.

GER 525 German Novel. (3)*not regularly offered*

Special studies in the German novel.

GER 527 The *Novelle*. (3)*not regularly offered*

Special studies in the German short story.

GER 531 Middle High German Language and Literature. (3)*not regularly offered*

Reading and discussion of specimens of the Middle High German epics, romances, and other literary genres.

GER 551 Romanticism. (3)*not regularly offered*

Treatment of early and late Romanticism.

GER 555 Modern German Literature. (3)*not regularly offered*

Major works from the period of Expressionism to 1945.

GER 591 Seminar. (1–12)*not regularly offered*

Special topics are concerned with a figure, theme, or work in German literature or Germanic studies. Possible topics:

- (a) Faust. (3)
- (b) Germanic Studies. (3)
- (c) Goethe. (3)
- (d) Grass and Böll. (3)
- (e) Hesse. (3)
- (f) Kafka. (3)
- (g) Kleist. (3)
- (h) Schiller. (3)

ANCIENT GREEK (GRK)**GRK 101 Elementary Ancient Greek. (4)***fall*

Ancient Greek grammar and vocabulary with an emphasis on developing reading skills. For beginning students only.

GRK 201 Intermediate Ancient Greek. (4)*spring*

Continuation of GRK 101. Increased emphasis on reading texts adapted from Aristophanes, Demosthenes, and Plato. Prerequisite: GRK 101 or instructor approval.

GRK 301 Ancient Greek Literature. (3)*fall*

Readings in the masterpieces of ancient Greek literature; advanced grammar. Authors read are changed each year in accordance with the needs of the class. May be repeated for credit. Prerequisite: GRK 201 or instructor approval.

*General Studies: HU***GRK 302 Ancient Greek Literature. (3)***spring*

Continuation of GRK 301. Prerequisite: GRK 201 or instructor approval.

General Studies: HU

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HEBREW (HEB)**HEB 101 Elementary Modern Hebrew. (4)***fall*

Reading, writing, speaking, and understanding of basic modern Hebrew, with emphasis on pronunciation and grammar. 4 hours lecture, 1 hour lab. Fee.

HEB 102 Elementary Modern Hebrew. (4)*spring*

Reading, writing, speaking, and understanding of basic modern Hebrew, with emphasis on pronunciation and grammar. 4 hours lecture, 1 hour lab. Fee. Prerequisite: HEB 101 (or its equivalent).

HEB 201 Intermediate Modern Hebrew. (4)*fall*

Intensive review of grammar, with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: HEB 102 (or its equivalent).

*General Studies: G***HEB 202 Intermediate Modern Hebrew. (4)***spring*

Intensive review of grammar, with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: HEB 201 (or its equivalent).

*General Studies: G***HEB 313 Advanced Modern Hebrew. (4)***fall*

Continued development of ability to communicate orally and in writing. Reading of selected literary works. Prerequisite: HEB 202 (or its equivalent).

HEB 314 Advanced Modern Hebrew. (4)*spring*

Continued development of ability to communicate orally and in writing. Reading of selected literary works. Prerequisite: HEB 313 (or its equivalent).

HEB 375 Contemporary Culture of Israel. (3)*fall and spring*

Intense study of aspects of historical, social, political, and cultural modern life in Israel. Beginning of Zionism to present day. Lecture, discussion.

*General Studies: HU, G***INDONESIAN (IDN)****IDN 101 Elementary Indonesian I. (5)***fall*

Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose reading. 4 hours lecture, 1 hour lab. Fee.

IDN 102 Elementary Indonesian II. (5)*spring*

Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose reading. 4 hours lecture, 1 hour lab. Fee. Prerequisite: IDN 101 (or its equivalent).

IDN 201 Intermediate Indonesian I. (5)*fall*

Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: IDN 102 (or its equivalent).

*General Studies: G***IDN 202 Intermediate Indonesian II. (5)***spring*

Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: IDN 201 (or its equivalent).

*General Studies: G***ITALIAN (ITA)****ITA 101 Elementary Italian. (5)***fall and spring*

Aural/oral drill in class and laboratory. Basic grammar supplemented by simple prose readings. 5 hours lecture, 1 hour lab. Fee.

ITA 102 Elementary Italian. (5)*fall and spring*

Aural/oral drill in class and laboratory. Basic grammar supplemented by simple prose readings. 5 hours lecture, 1 hour lab. Fee. Prerequisite: ITA 101 (or its equivalent).

ITA 201 Intermediate Italian. (3)*fall and spring*

Systematic review of grammar. Development of vocabulary through reading, listening, speaking, and writing. 3 hours lecture, 1 hour lab. Fee. Prerequisite: ITA 102 (or its equivalent).

*General Studies: G***ITA 202 Intermediate Italian. (3)***fall and spring*

Systematic review of grammar. Development of vocabulary through reading, listening, speaking, and writing. 3 hours lecture, 1 hour lab. Fee. Prerequisite: ITA 201 (or its equivalent).

*General Studies: G***ITA 311 Italian Composition and Conversation. (3)***fall and spring*

Development of writing ability and oral expression. Prerequisite: ITA 202 (or its equivalent).

*General Studies: G***ITA 312 Italian Composition and Conversation. (3)***fall and spring*

See ITA 311. Prerequisite: ITA 202 (or its equivalent).

*General Studies: G***ITA 314 Advanced Italian. (3)***not regularly offered*

Advanced grammar and composition with readings of selected literary works. Prerequisite: ITA 202 or instructor approval.

*General Studies: G***ITA 325 Introduction to Italian Literature. (3)***fall*

Italian literature through the interpretation of representative works in drama, poetry, and novel. Prerequisite: ITA 202 or instructor approval.

*General Studies: HU***ITA 394 Special Topics. (1–4)***not regularly offered***ITA 415 Italian Civilization. (3)***not regularly offered*

General survey of history, literature, art, and music, emphasizing Italy's cultural contribution to Western civilization. Prerequisites: ITA 311, 312 (or 314).

*General Studies: L/HU, G***ITA 420 Italian Cinema. (3)***fall*

Major trends of Italian cinema from the post-war period to the present.

ITA 425 Italian American Culture. (3)*spring*

Analyzes representations of Italian American history and culture in several media including literature, film, and television. Lecture, discussion.

ITA 430 Italian Literature of the Middle Ages. (3)*not regularly offered*

Emphasis on "Stil Novo," Dante's minor works, Petrarch, and Boccaccio. Prerequisite: ITA 325 or instructor approval.

*General Studies: HU***ITA 441 Dante: *Divina Commedia*. (3)***not regularly offered*

Critical reading of the three Cantiche (Inferno, Purgatorio, and Paradiso). Prerequisite: ITA 325.

*General Studies: L/HU***ITA 443 Italian Literature of the Renaissance. (3)***not regularly offered*

Emphasis on Lorenzo de' Medici, Poliziano Castiglione, Machiavelli, Ariosto, and Tasso. Prerequisite: ITA 325 or instructor approval.

*General Studies: HU, H***ITA 446 Italian Literature of the 18th and 19th Centuries. (3)***not regularly offered*

Goldoni, Parini, Alfieri, the poetry of Foscolo and Leopardi, and the sociohistorical novels of Foscolo, Manzoni, and Verga. Prerequisite: ITA 325 or instructor approval.

General Studies: HU

ITA 449 20th-Century Italian Literature. (3)*not regularly offered*

Major works, figures, and movements of contemporary Italian literature. Prerequisite: ITA 325.

*General Studies: HU, G***ITA 494 Special Topics. (1–4)***not regularly offered*

Possible topics:

(a) Italian/American Culture. (3)

ITA 499 Individualized Instruction. (1–3)*not regularly offered***JAPANESE (JPN)****JPN 101 Elementary Japanese. (5)***fall*

Communication skills and basic skills in grammar, reading, and writing, including hiragana, katakana, and about 75 kanji. 5 hours per week. Fee.

JPN 102 Elementary Japanese. (5)*spring*

Continuation of JPN 101. Additional 99 kanji. Continued development of communication skills in speaking, listening, reading, writing, and culture. Fee. Prerequisite: JPN 101 (or its equivalent).

JPN 107 Japanese for International Professions I. (10)*fall*

Accelerated program alternative to JPN 101, 102 sequence. Functional approach to needs of international professions. 10 hours per week. Fee.

JPN 201 Intermediate Japanese. (5)*fall*

Continued development of communication skills. Increased emphasis on reading and writing. Review of fundamentals of structure to increase student's abilities in composition and translation. 5 hours per week. Fee. Prerequisite: JPN 102 (or its equivalent).

*General Studies: G***JPN 202 Intermediate Japanese. (5)***spring*

Continuation of JPN 201. Fee. Prerequisite: JPN 201 (or its equivalent).

*General Studies: G***JPN 206 Calligraphy. (1)***not regularly offered*

Introduction to the practice of calligraphy in Japan, with emphasis on the derivation of Japanese kana syllabaries from Chinese characters. Prerequisite: CHI 205 or JPN 101.

JPN 207 Japanese for International Professions II. (10)*spring*

Continuation of JPN 107, alternative to JPN 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. 10 hours per week. Fee. Prerequisite: JPN 107 or instructor approval.

*General Studies: G***JPN 309 Intermediate Japanese Conversation. (2)***fall*

Practice in current usage in expression of ideas. Recommended especially for those who have not had the opportunity to practice Japanese in Japan. Prerequisite: JPN 202.

JPN 310 Intermediate Japanese Conversation. (2)*spring*

Continuation of JPN 309. Prerequisite: JPN 309.

JPN 311 Japanese Conversation and Composition. (3)*fall*

Intensive aural/oral practice leading toward conversational fluency. Practice in writing Japanese, emphasizing current usage. Prerequisite: JPN 202.

*General Studies: G***JPN 312 Japanese Conversation and Composition. (3)***spring*

See JPN 311. Prerequisite: JPN 202.

*General Studies: G***JPN 313 Advanced Japanese. (3)***fall*

Continued development of ability to communicate orally and in writing. Exposure to the variety of Japanese written styles. Prerequisite: JPN 202 (or its equivalent).

*General Studies: G***JPN 314 Advanced Japanese. (3)***spring*

See JPN 313. Prerequisite: JPN 313 or instructor approval.

*General Studies: G***JPN 321 Japanese Literature. (3)***not regularly offered*

Readings in representative masterpieces of modern Japanese literature. Authors read change each year in accordance with the needs of the class. May be repeated for credit. Prerequisite: JPN 313 or instructor approval.

*General Studies: L/HU, G***JPN 394 Special Topics. (1–4)***not regularly offered***JPN 414 Introduction to Classical Japanese. (3)***spring*

Readings from various genres of pre-20th-century literature, with analysis of the structure of the classical language. Prerequisite: JPN 313 or instructor approval.

JPN 435 Advanced Readings. (3)*not regularly offered*

Readings in history, art, religious studies, economics, or other fields. Lecture, discussion. Prerequisite: JPN 314 (or its equivalent).

JPN 485 Problems of Translation. (3)*not regularly offered*

Theories and practice of translation: strategies for handling a variety of Japanese texts. Lecture, discussion. Prerequisite: JPN 314 (or its equivalent).

JPN 494 Special Topics. (1–4)*not regularly offered***JPN 499 Individualized Instruction. (1–3)***not regularly offered***JPN 500 Bibliography and Research Methods. (3)***not regularly offered*

Introduction to research materials on Japan both in Japanese and in Western languages. Overview of research methods. Lecture, discussion.

JPN 514 Advanced Premodern Japanese. (3)*not regularly offered*

Close readings of selected premodern texts, with focus on grammatical and stylistic features. Lecture, discussion. Prerequisite: JPN 414 (or its equivalent).

JPN 520 Teaching of Japanese as a Second Language. (3)*not regularly offered*

Theory and practice of teaching Japanese, including presentation, interaction, and evaluation, with consideration given to cultural factors. Lecture, discussion.

JPN 535 Advanced Readings. (3)*not regularly offered*

Readings in primary and secondary sources in history, art, religious studies, literature, or other fields. Lecture, discussion. Prerequisite: JPN 414 (or its equivalent).

JPN 543 Japanese Language and Linguistics. (3)*not regularly offered*

Analysis and discussion of linguistic theories applied to Japanese phonology, morphology, and syntax, including psychological, sociological, and historical aspects.

JPN 585 Advanced Problems of Translation. (3)*not regularly offered*

Theories and practice of translation; strategies for handling a variety of Japanese texts. Lecture, discussion. Prerequisite: JPN 435 (or its equivalent).

JPN 591 Seminar. (3)*not regularly offered*

Topics in literary, linguistic, or cultural studies.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

KOREAN (KOR)**KOR 101 Elementary Korean I. (5)***fall*

Pronunciation, grammar, elementary conversation, and development of basic reading and writing skills including Han'gul. Lecture, recitation.

KOR 102 Elementary Korean II. (5)*spring*

Continuation of KOR 101. Lecture, recitation. Prerequisite: KOR 101 (or its equivalent).

KOR 201 Intermediate Korean I. (5)*fall*

Continual development of communication skills. Increased emphasis on reading and writing, vocabulary building, and review of fundamentals. Lecture, recitation. Prerequisite: KOR 102 (or its equivalent).

*General Studies: G***KOR 202 Intermediate Korean II. (5)***spring*

Continuation of KOR 201. Lecture, recitation. Prerequisite: KOR 201 (or its equivalent).

*General Studies: G***KOR 250 Korean Culture and Society. (3)***once a year*

Survey of Korean culture and society, covering history, religious traditions, gender, and popular culture. Lecture, discussion.

LATIN (LAT)**LAT 101 Elementary Latin. (4)***fall and spring*

Basic Latin grammar with an emphasis on developing reading skills. For beginning students only.

LAT 102 Elementary Latin. (4)*fall and spring*

Continuation of LAT 101. Prerequisite: LAT 101 (or its equivalent).

LAT 201 Intermediate Latin. (4)*fall*

Selected Latin literature, both classical and postclassical; Virgil's *Aeneid*; advanced grammar. Prerequisite: LAT 102 or instructor approval.

*General Studies: HU***LAT 202 Intermediate Latin. (4)***spring*

See LAT 201. Students entering LAT 202 directly from LAT 102 must complete LAT 201 to satisfy the College of Liberal Arts and Sciences second language requirement. Prerequisite: LAT 102 or instructor approval.

*General Studies: HU***LAT 421 Roman Literature. (3)***fall*

Readings in the Latin masterpieces. Authors read change each year in accordance with needs of the class. May be repeated for credit. Prerequisite: LAT 202 or instructor approval.

*General Studies: HU***LAT 422 Roman Literature. (3)***spring*

See LAT 421. Prerequisite: LAT 202 or instructor approval.

*General Studies: HU***NORWEGIAN (NOR)****NOR 101 Elementary Norwegian. (4)***fall*

Reading, writing, speaking and understanding of basic Norwegian. 4 hours lecture, 1 hour lab. Fee.

NOR 102 Elementary Norwegian. (4)*spring*

Reading, writing, speaking and understanding of basic Norwegian. 4 hours lecture, 1 hour lab. Fee. Prerequisite: NOR 101 (or its equivalent).

NOR 201 Intermediate Norwegian. (4)*fall*

Review of Norwegian grammar with emphasis on the development of the skills of speaking, listening comprehension, reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: NOR 102 (or its equivalent).

NOR 202 Intermediate Norwegian. (4)*spring*

Review of Norwegian grammar with emphasis on the development of the skills of speaking, listening comprehension, reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: NOR 201 (or its equivalent).

PORTUGUESE (POR)**POR 101 Elementary Portuguese. (5)***fall*

Basic grammar with intensive drills in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab. Fee. Prerequisite: 1 year of Spanish or French or Italian or instructor approval.

POR 201 Intermediate Portuguese. (5)*spring*

Continuation of POR 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab. Fee. Prerequisite: POR 101 or instructor approval.

*General Studies: G***POR 313 Portuguese Composition and Conversation. (3)***fall*

Develops skill in written Portuguese and corrected oral expression. Must be taken in sequence. Prerequisite: POR 201 or instructor approval.

*General Studies: G***POR 314 Portuguese Composition and Conversation. (3)***spring*

Continuation of POR 313. Prerequisite: POR 313 or instructor approval.

*General Studies: G***POR 321 Luso-Brazilian Literature. (3)***not regularly offered*

Representative masterpieces of Portuguese and Brazilian literature from the beginning to the present. Prerequisite: POR 313 or instructor approval.

*General Studies: HU***POR 472 Luso-Brazilian Civilization. (3)***not regularly offered*

Lectures, readings, and discussion of important aspects of Luso-Brazilian civilization. Topics from music, art, folklore, literature, history, and politics. Prerequisite: POR 313 or instructor approval.

*General Studies: HU, G***ROMANIAN (ROM)****ROM 101 Elementary Romanian. (5)***fall*

Basic grammar with intensive drills in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab.

ROM 201 Intermediate Romanian. (5)*fall*

Continuation of ROM 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab. Prerequisite: ROM 101 or instructor approval.

ROM 313 Romanian Composition and Conversation. (3)*spring*

Develops skills in written Romanian and correct oral expression. Must be taken in sequence with ROM 314. Prerequisite: ROM 201 or instructor approval.

ROM 314 Romanian Composition and Conversation. (3)*spring*

Continuation of ROM 313. Develops skills in written Romanian and correct oral expression. Must be taken in sequence. Prerequisite: ROM 313 or instructor approval.

ROM 494 Special Topics. (1-4)*once a year***RUSSIAN (RUS)****RUS 101 Elementary Russian. (4)***fall, spring, summer*

Structural grammar and basic vocabulary. Introduction and reinforcement of aural/oral reading and writing skills. 4 hours lecture, 1 hour lab. Fee.

RUS 102 Elementary Russian. (4)*spring and summer*

See RUS 101. Fee. Prerequisite: RUS 101 (or its equivalent).

RUS 201 Intermediate Russian. (4)*fall and summer*

Systematic review of grammar. Development of vocabulary through reading and writing. Drill in aural/oral skills. 4 hours lecture, 1 hour lab. Fee. Prerequisite: RUS 102 (or its equivalent).

*General Studies: G***RUS 202 Intermediate Russian. (4)***spring and summer*

See RUS 201. Fee. Prerequisite: RUS 201 (or its equivalent).

*General Studies: G***RUS 211 Basic Russian Conversation. (3)***fall*

Intensive aural/oral drill to supplement reading and grammatical skills acquired in RUS 101, 102, 201, and 202. Required of Russian majors. Fee. Prerequisite: RUS 102.

*General Studies: G***RUS 212 Basic Russian Conversation. (3)***spring*

See RUS 211. Fee. Prerequisite: RUS 102.

*General Studies: G***RUS 303 Scientific Russian. (3)***fall*

Acquisition of scientific vocabulary through reading from current Russian scientific publications. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree. Prerequisite: RUS 102.

RUS 304 Scientific Russian. (3)*spring*

See RUS 303. Prerequisite: RUS 102.

RUS 311 Russian Composition and Conversation. (3)*fall*

Develops writing ability and oral expression. Prerequisite: RUS 202.

*General Studies: G***RUS 312 Russian Composition and Conversation. (3)***spring*

See RUS 311. Prerequisite: RUS 202.

*General Studies: G***RUS 321 Survey of Russian Literature. (3)***once a year*

Main literary movements, authors, and significant works of prose, poetry, and drama from the beginning to the mid-19th century in translation. Prerequisite: RUS 202 (or its equivalent).

*General Studies: L/HU, H***RUS 322 Survey of Russian Literature. (3)***once a year*

Insight into the 19th- and early 20th-century Russian thought, life, and culture by reading translations of works of major writers. Prerequisite: RUS 202 (or its equivalent).

*General Studies: L/HU***RUS 323 Survey of Literature of the Soviet Era. (3)***once a year*

Main literary movements, prominent authors, and the most significant works of prose, poetry, and drama of the Soviet period from 1917–1991. Prerequisite: RUS 202 (or its equivalent).

*General Studies: L/HU, G***RUS 411 Advanced Composition and Conversation I. (3)***fall*

Improves aural discrimination and self-expression in oral and written skills, emphasizing vocabulary building. Subject materials drawn from current post-Soviet-Russian publications. Prerequisite: RUS 312.

*General Studies: G***RUS 412 Advanced Composition and Conversation II. (3)***spring*

See RUS 411. Prerequisite: RUS 312.

*General Studies: G***RUS 417 Applied Russian Phonetics. (2)***not regularly offered*

General improvement in the student's language skills through aural/oral training in Russian phonology and an analysis of Russian orthography. Prerequisite: RUS 102.

RUS 420 Russian Poetry. (3)*not regularly offered*

Development of Russian poetry from its beginnings to the present, including both native and émigré poets. Topics in criticism and the study of poetics. Prerequisite: RUS 312 or instructor approval.

*General Studies: L/HU***RUS 421 Pushkin. (3)***not regularly offered*Pushkin's poetry, plays, and prose fiction, including *Eugene Onegin*, *The Little Tragedies*, *Tales of Belkin*, *Queen of Spades*, and *The Captain's Daughter*. Taught in English. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree.*General Studies: L/HU***RUS 423 Dostoyevsky. (3)***not regularly offered*Dostoyevsky's major works of fiction, including *Crime and Punishment* and *Brothers Karamazov*. Taught in English. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree.*General Studies: L/HU***RUS 424 Tolstoy. (3)***not regularly offered*Tolstoy's major works, including *War and Peace* and *Anna Karenina*. Taught in English. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree.*General Studies: L/HU***RUS 425 Chekhov. (3)***not regularly offered*Chekhov's major works, representative short stories and major plays, including *The Cherry Orchard* and *Three Sisters*. Taught in English. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree.*General Studies: L/HU***RUS 426 Literatures of the Nationalities of the Former Soviet Union. (3)***not regularly offered*

Includes such authors as Belsevica, Kross, Venclova, Kupala, Khvylovy, Sevak, Nasri, Aitmatov, Charents, Cholpan. Prerequisite: RUS 312 or instructor approval.

*General Studies: L/HU, G***RUS 430 Russian Short Story. (3)***not regularly offered*

Detailed study of representative works of the Russian short story genre. Includes authors from both Imperial and Soviet Russia. Prerequisite: RUS 312 or instructor approval.

*General Studies: L/HU***RUS 440 History of the Russian Language. (3)***not regularly offered*

Principles of historical linguistics presented through the evolution of the Russian language from Proto-Indo-European to the present. Readings of historical documents in Old Russian and Old Church Slavonic. Prerequisite: RUS 312 or instructor approval.

RUS 441 Survey of Russian Culture. (3)*not regularly offered*

Interplay of artistic, social, and political forces in the development of Russian culture from the Kievan period to the present. Exclusive use of Russian language source materials. Prerequisite: RUS 312 or instructor approval.

*General Studies: L/HU, G, H***RUS 494 Special Topics. (1–4)***not regularly offered***RUS 499 Individualized Instruction. (1–3)***not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

RUS 591 Seminar. (1–12)*not regularly offered*

Possible topics:

- (a) Baltic Literatures. (3)
- (b) Literature from 1956 to August 1991. (3)
- (c) Literary Zhdanovism. (3)
- (d) 19th-Century Russian. (3)
- (e) Post-Soviet Literature. (3)
- (f) Pre-19th-Century Russian Literature. (3)
- (g) Russian Literary Criticism. (3)
- (h) Russian Poetry to 1890. (3)
- (i) Russian Poetry, 1890 to Present. (3)

SCANDINAVIAN (SCA)**SCA 250 Introduction to Scandinavian Culture. (3)***spring*

Scandinavian identity from an interdisciplinary perspective with historic overview. Lecture, discussion.

*General Studies: HU, G, H***SCA 314 Medieval Scandinavia. (3)***fall and spring*

Study in English translation of the Sagas, Edda, and Skaldic poetry, history and mythology of the Vikings.

SCA 315 Old Norse. (3)*fall and spring*

Readings and study of grammatical structures of Medieval Scandinavian with emphasis on the Sagas and Edda poetry and historical writings.

SCA 316 Scandinavian Cinema. (3)*fall and spring*

Presentation of Scandinavian film, with English subtitles, as representatives of contemporary and historical culture.

*General Studies: HU, G***SCA 450 Masterpieces of Scandinavian Literature. (3)***spring*

Scandinavian literature in translation in its cultural and historical contexts.

*General Studies: L/HU***SPANISH (SPA)**

SPA Note 1. Students who have completed their secondary education in a school where Spanish was the official language of instruction should begin their studies at the 325 level or above. No student who has completed more than two years of high school in a Spanish-speaking country, where Spanish is the medium of instruction in the school, is allowed to register in a Spanish language class below the 400 level.

SPA 101 Elementary Spanish. (4)*fall, spring, summer*

Fundamentals of the language. Emphasis on listening, speaking, reading, and writing. Credit is allowed for only SPA 101 or 111. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1.

SPA 102 Elementary Spanish. (4)*fall, spring, summer*

See SPA 101. Credit is allowed for only SPA 102 or 111. Fee. See SPA Note 1. Prerequisite: SPA 101 (or its equivalent).

SPA 107 Spanish for International Professions I. (8)*fall*

Accelerated program alternative to SPA 101, 102 sequence. Functional approach to needs of international professions. Fee. See SPA Note 1.

SPA 111 Fundamentals of Spanish. (4)*fall and spring*

Primarily for students with two years of high school Spanish who need review to enter second-year study. Credit is allowed for only SPA 111 or both SPA 101 and 102. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1.

SPA 201 Intermediate Spanish. (4)*fall, spring, summer*

Continuation of fundamentals. Emphasis on the development of the skills of reading, listening comprehension, speaking, writing, and culture. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1. Prerequisite: SPA 102 or 111.

*General Studies: G***SPA 202 Intermediate Spanish. (4)***fall, spring, summer*

See SPA 201. Fee. See SPA Note 1. Prerequisite: SPA 201 (or its equivalent).

*General Studies: G***SPA 203 Intermediate Spanish for Bilinguals. (4)***fall*

For Spanish-speaking students, in lieu of SPA 201. Composition, literature, conversation, grammar fundamentals. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1. Prerequisite: SPA 102 or 111 or placement examination.

*General Studies: G***SPA 204 Intermediate Spanish for Bilinguals. (4)***spring*

For Spanish-speaking students, in lieu of SPA 202. Composition, literature, conversation, grammar fundamentals. 4 hours lecture, 1 hour lab. See SPA Note 1. Prerequisite: SPA 203 (or its equivalent).

*General Studies: G***SPA 207 Spanish for International Professions II. (8)***spring*

Continuation of SPA 107, alternative to SPA 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Fee. See SPA Note 1. Prerequisite: SPA 107 or instructor approval.

*General Studies: G***SPA 311 Spanish Conversation. (3)***fall and spring*

Designed primarily for nonmajors to promote vocabulary building and communicative expression in Spanish through discussions based on cultural readings. See SPA Note 1. Prerequisite: SPA 202 (or its equivalent).

SPA 312 Spanish Conversation. (3)*fall and spring*

See SPA 311. See SPA Note 1. Prerequisite: SPA 311 (or its equivalent).

SPA 313 Spanish Conversation and Composition. (3)*fall, spring, summer*

Designed to develop skill and accuracy in spoken and written Spanish. Required of majors; SPA 313 and 314 must be taken in sequence. See SPA Note 1. Prerequisite: SPA 202 (or its equivalent).

*General Studies: G***SPA 314 Spanish Conversation and Composition. (3)***fall, spring, summer*

See SPA 313. See SPA Note 1. Prerequisite: SPA 313 (or its equivalent).

*General Studies: G***SPA 315 Spanish Conversation and Composition for Bilinguals. (3)***fall*

Emphasis on comparing standard Spanish with regional Southwest Spanish. May be taken in lieu of SPA 313 and 314. See SPA Note 1. Prerequisite: SPA 202 or 204 or instructor approval.

SPA 316 Spanish Conversation and Composition for Bilinguals. (3)*spring*

See SPA 315. See SPA Note 1. Prerequisite: SPA 315 (or its equivalent).

SPA 319 Business Correspondence and Communication. (3)*not regularly offered*

Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. See SPA Note 1. Prerequisite: SPA 314 or 316 or instructor approval.

*General Studies: G***SPA 325 Introduction to Hispanic Literature. (3)***fall and spring*

Critical approach to and analysis of literary types, including poetry, drama, short story, and novel. Required of all majors. See SPA Note 1. Prerequisite: SPA 313.

General Studies: HU

SPA 400 Introduction to Spanish Linguistics. (3)*fall*

Introduction to the discipline and methods of linguistics through the study of Spanish data. Prerequisite: SPA 412 (or its equivalent).

SPA 412 Advanced Conversation and Composition. (3)*fall and spring*

Oral and written Spanish communication skills, with particular attention given to developing fluency and facility. Required of majors. Prerequisite: SPA 314 or 316 or instructor approval.

*General Studies: G***SPA 413 Advanced Spanish Grammar. (3)***fall*

Intensive analysis of the Spanish language. Required of teaching majors. Prerequisite: SPA 314 or 316 or instructor approval.

*General Studies: G***SPA 417 Spanish Phonetics and Phonology. (3)***fall*

Introduction to the theory and practice of Spanish phonetics and phonology. Prerequisite: SPA 412.

SPA 420 Applied Spanish Linguistics. (3)*spring*

Application of linguistic principles to the teaching of Spanish. Prerequisites: FLA 400 (or its equivalent); SPA 412.

*General Studies: L***SPA 421 Spanish in the Southwest. (3)***fall*

Discussion and linguistic analysis of Southwest Spanish. Prerequisite: SPA 412.

*General Studies: L/SB, C***SPA 425 Spanish Literature. (3)***fall and spring*

Survey of Spanish literature from its beginning to 1700. Prerequisite: SPA 325.

*General Studies: HU***SPA 426 Spanish Literature. (3)***fall and spring*

Surveys Spanish literature from 1700 to the present. Prerequisite: SPA 325.

*General Studies: HU***SPA 427 Spanish American Literature. (3)***fall and spring*

Surveys major works, figures, and movements from Colonial period to 1880. Prerequisite: SPA 325.

*General Studies: L***SPA 428 Spanish American Literature. (3)***fall and spring*

Surveys major works, figures, and movements from 1880 to the present. Prerequisite: SPA 325.

*General Studies: L, G***SPA 429 Mexican Literature. (3)***not regularly offered*

Selected readings from pre-Columbian writers/poets (e.g., Macuixó-chitl) through the novel of the Revolution to the present. Prerequisite: SPA 325.

SPA 434 Drama of the Golden Age. (3)*spring*

Dramatic works of Lope de Vega, Calderón de la Barca, and their contemporaries. Prerequisite: SPA 325.

SPA 435 Cervantes—*Don Quijote*. (3)*fall*

Don Quijote and the development of the novel. Prerequisite: SPA 325.

SPA 454 19th-Century Spanish American Narrative. (3)*fall*

Principal works in the novel, short story, narrative fiction, and narrative (Gauchesque) poetry. Prerequisite: SPA 325.

SPA 456 20th-Century Spanish American Fiction. (3)*spring*

Major works and movements. Prerequisite: SPA 325.

SPA 464 Mexican American Literature. (3)*fall*

Representative literature in Spanish and English by Mexican Americans, emphasizing sociocultural as well as literary values. Prerequisite: SPA 325.

*General Studies: HU***SPA 471 Civilization of the Spanish Southwest. (3)***spring*

Political, intellectual, social, economic, and artistic development of the Spanish-speaking people of the Southwest. Prerequisite: SPA 314 or 316 or instructor approval.

*General Studies: HU***SPA 472 Spanish American Civilization. (3)***fall*

Growth of the institutions and cultures of Spanish American people. Prerequisite: SPA 314 or 316 or instructor approval.

*General Studies: HU, G, H***SPA 473 Spanish Civilization. (3)***spring*

Political, intellectual, social, economic, and artistic development of the Spanish nation from its origin to the present. Prerequisite: SPA 314 or 316 or instructor approval.

*General Studies: HU/SB, G***SPA 485 Mexican American Short Story. (3)***not regularly offered*

Critical study of contemporary short stories by Mexican American authors, with emphasis on their Spanish-language writings. Prerequisite: SPA 325 or instructor approval.

*General Studies: L***SPA 486 Mexican American Novel. (3)***not regularly offered*

Social and literary contexts of representative novelists, emphasizing their Spanish-language writings. Prerequisite: SPA 325 or instructor approval.

SPA 487 Mexican American Drama. (3)*not regularly offered*

Representative dramatic works, with emphasis on the history and development of this genre from its regional origins to the present. Prerequisite: SPA 325 or instructor approval.

SPA 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

- (a) Introduction to Hispanic Linguistics. (3)
- (b) Lexicography. (3)

SPA 500 Bibliography and Research Methods. (3)*fall*

Required of all graduate students.

SPA 536 Generation of 1898. (3)*not regularly offered*

Works of Unamuno, Baroja, Azorín, and their contemporaries, studied against the ideological background of the turn of century in Spain. Prerequisite: SPA 325.

SPA 540 History of the Spanish Language. (3)*spring*

Analyzes and discusses the development of Spanish from Vulgar Latin to the present day. Prerequisite: FLA 400 (or its equivalent).

SPA 541 Spanish Language in America. (3)*fall*

Discusses and analyzes various regional and social varieties of Spanish in the Americas. Prerequisite: FLA 400 (or its equivalent).

SPA 542 Studies in the Spanish of the Southwest. (3)*spring*

Examines bilingualism and the social and regional dialects of Spanish in the Southwest. Prerequisite: FLA 400 (or its equivalent).

SPA 543 Structure of Spanish. (3)*spring*

Analyzes and discusses data on selected topics in Spanish morphology, semantics, and syntax. Prerequisite: FLA 400 (or its equivalent).

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

SPA 544 Spanish Phonology. (3)*spring*

Surveys problems of Spanish phonology within the context of recent phonological theory. Prerequisite: FLA 400 (or its equivalent).

SPA 545 Concepts of Literary Criticism. (3)*spring*

Aims and methods of modern literary scholarship. Discusses major theories of literary analysis.

SPA 555 Spanish American Modernism. (3)*not regularly offered*

Principal works and figures of literary modernism, 1880–1920, with emphasis on international literary context of the movement. Prerequisite: SPA 325.

SPA 557 Contemporary Spanish American Poetry. (3)*not regularly offered*

Major works and problems in contemporary poetry and poetics, with emphasis on Paz, Parra, Cardenal, and new poetry since 1960. Prerequisite: SPA 325.

SPA 560 Medieval Spanish Literature. (3)*not regularly offered*

Major figures and works of the Middle Ages in Spain.

SPA 561 Golden Age Spanish Prose Fiction. (3)*not regularly offered*

Major figures and works of the 16th and 17th centuries, with emphasis on the picaresque novel.

SPA 562 Golden Age Spanish Poetry. (3)*not regularly offered*

Major figures and works of the 16th and 17th centuries, with emphasis on lyric poetry.

SPA 563 Spanish Romanticism. (3)*not regularly offered*

Principal figures and works of the Spanish romanticism, with emphasis on international literary context of the movement.

SPA 564 19th-Century Spanish Prose Fiction. (3)*not regularly offered*

Principal figures and works of realism in the 19th-century novel, with emphasis on Galdós.

SPA 565 20th-Century Spanish Drama. (3)*not regularly offered*

Principal figures and works of Spanish dramatic literature from the Generation of 1898 to the present.

SPA 566 Generation of 1927. (3)*not regularly offered*

Major poets of the Generation of 1927, with emphasis on works of Lorca, Guillén, Salinas, and Aleixandre.

SPA 567 Contemporary Spanish Novel. (3)*not regularly offered*

Major works of post-Civil War Spanish fiction.

SPA 568 Cervantes. (3)*not regularly offered*

Extensive analysis of the prose and theater of Cervantes as a key figure of the Spanish Golden Age. Lecture, seminar.

SPA 570 Indigenous Literatures of Spanish America. (3)*not regularly offered*

Indigenous literary traditions, with emphasis on Nahuatl, Mayan, and Quechua literatures through readings in Spanish translations.

SPA 571 Colonial Spanish American Literature. (3)*not regularly offered*

Major figures and works from conquest to independence.

SPA 572 Spanish American Drama. (3)*not regularly offered*

Major contributions of Spanish American drama, with emphasis on contemporary dramatists.

SPA 573 Spanish American Essay. (3)*not regularly offered*

Major works of the essay, within the framework of intellectual history and literary movements.

SPA 574 Spanish American Vanguard Poetry. (3)*not regularly offered*

Examines poetic developments, 1920–1940, with emphasis on Huidobro, Vallejo, Neruda, and the international context of their works.

SPA 575 Contemporary Spanish American Novel. (3)*not regularly offered*

Principal novels of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

SPA 576 Contemporary Spanish American Short Story. (3)*not regularly offered*

Principal short stories of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

SPA 577 Regional Spanish American Literature. (3)*not regularly offered*

Figures and works of major national (Peru, Argentina, Chile, and Mexico) and regional (Caribbean) literatures. Topics offered on a rotating basis. May be repeated when topics vary.

SPA 578 Novel of the Mexican Revolution. (3)*not regularly offered*

Representative works and authors of this genre (Guzmán, Azuela, Urquiza, Muñoz, and Romero), including related or peripheral offshoots in indigenous novels.

SPA 581 Latin American Popular Culture. (3)*not regularly offered*

Studies in selected topics of Latin American popular culture, with emphasis on appropriate academic models for the critical analysis of these materials.

SPA 582 Studies in Latin American Film. (3)*not regularly offered*

Examines the role of film in contemporary Latin American culture; films viewed and analyzed as casebook examples. Seminar.

SPA 591 Seminar. (3)*not regularly offered*

Spanish and Spanish American literary, cultural, and linguistic topics.

SPA 691 Figures and Works Seminar. (3)*not regularly offered*

Topics may be selected from Spanish and Spanish American literatures.

SWEDISH (SWE)**SWE 101 Elementary Swedish. (4)***fall*

Reading, writing, speaking, and understanding of basic Swedish. 4 hours lecture, 1 hour lab. Fee.

SWE 102 Elementary Swedish. (4)*spring*

Reading, writing, speaking, and understanding of basic Swedish. 4 hours lecture, 1 hour lab. Fee. Prerequisite: SWE 101 (or its equivalent).

SWE 201 Intermediate Swedish. (4)*fall*

Reviews Swedish grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: SWE 102 (or its equivalent).

SWE 202 Intermediate Swedish. (4)*spring*

Reviews Swedish grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: SWE 201 (or its equivalent).

THAI (THA)**THA 101 Elementary Thai I. (5)***fall*

Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose readings in Thai script. 4 hours lecture, 1 hour lab. Fee.

THA 102 Elementary Thai II. (5)*spring*

Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose reading. 4 hours lecture, 1 hour lab. Fee. Prerequisite: THA 101 (or its equivalent).

THA 201 Intermediate Thai I. (5)*fall*

Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: THA 102 (or its equivalent).

General Studies: G

THA 202 Intermediate Thai II. (5)*spring*

Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: THA 201 (or its equivalent).

*General Studies: G***VIETNAMESE (VTN)****VTN 101 Elementary Vietnamese I. (5)***fall*

Basic skills in modern conversational Vietnamese and development of basic reading and writing skills, with special emphasis on tones. 4 hours lecture, 1 hour lab.

VTN 102 Elementary Vietnamese II. (5)*spring*

Basic skills in modern conversational Vietnamese and development of basic reading and writing skills, with special emphasis on tones. 4 hours lecture, 1 hour lab. Prerequisite: VTN 101 (or its equivalent).

VTN 201 Intermediate Vietnamese I. (5)*fall*

Improves students' speaking, listening, reading, and writing competence through dialogues, reading passages, pattern drill, and grammar and communicative exercises. 4 hours lecture, 1 hour lab. Prerequisite: VTN 102 (or its equivalent).

*General Studies: G***VTN 202 Intermediate Vietnamese II. (5)***spring*

Improves students' speaking, listening, reading, and writing competence through dialogues, reading passages, pattern drill, and grammar and communicative exercises. 4 hours lecture, 1 hour lab. Prerequisite: VTN 201 (or its equivalent).

General Studies: G

ASU CARES is a program that allows students, faculty, and staff an opportunity to give service to the community outside the campus.

Tim Trumble photo

Department of Mathematics

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Chair

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The Department of Mathematics offers the B.A. and B.S. degrees in Mathematics. Students who plan to attend graduate school in mathematics or statistics should choose the B.S. degree. The B.S. degree in Mathematics is available with a concentration in computational mathematical sciences; however, the requirements for the degree with the concentration are distinct from the requirements for the degree without the concentration.

The department also offers a minor in Mathematics and an academic specialization in mathematics for students pursuing the B.A.E. degree in Secondary Education.

Related Field Course List. All students majoring in Mathematics need to refer to the related field course list. It is available from an advisor in PS A211, or from the department Web site at math.la.asu.edu/~undergrd/underprog/degree/related-fields.html.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MATHEMATICS—B.A.

The B.A. degree in Mathematics requires a minimum of 36 semester hours of course work in mathematics and statistics, and additional course work in closely related fields, for a total of 51 semester hours. A grade of “C” or higher is required in all courses taken for the major. MAT 370 and 371 may not be used to satisfy these degree requirements. The required course work has the following components:

Core Courses

MAT 270	Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271	Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272	Calculus with Analytic Geometry III <i>MA</i>	4
MAT 300	Mathematical Structures <i>L</i>	3
MAT 342	Linear Algebra	3
MAT 370	Intermediate Calculus	3
	or MAT 371 Advanced Calculus I (3)	—
Total		21

Computer Science Requirement

CSE 100	Principles of Programming with C++ <i>CS</i>	3
	or CSE 200 Concepts of Computer Science <i>CS</i> (3)	—
Total		3

Advanced Courses in Mathematics and Statistics

Two courses from the following list, both preferably taken from the same grouping.....6

Algebra, Topology, and Number Theory

MAT 410	Introduction to General Topology (3)
MAT 442	Advanced Linear Algebra (3)
MAT 443	Introduction to Abstract Algebra (3)
MAT 444	Intermediate Abstract Algebra (3)
MAT 445	Theory of Numbers (3)

Analysis and Applications

MAT 372	Advanced Calculus II (3)
MAT 461	Applied Complex Analysis (3)
MAT 472	Intermediate Real Analysis (3)

Applied Mathematics and Dynamics

MAT 451	Mathematical Modeling <i>CS</i> (3)
MAT 452	Introduction to Chaos and Nonlinear Dynamics (3)
MAT 455	Introduction to Fractals and Applications (3)

Computational Mathematics

MAT 420	Scientific Computing (3)
MAT 421	Applied Computational Methods <i>CS</i> (3)
MAT 423	Numerical Analysis I <i>CS</i> (3)
MAT 425	Numerical Analysis II <i>CS</i> (3)
MAT 427	Computer Arithmetic <i>CS</i> (3)

Differential Equations

MAT 462	Applied Partial Differential Equations (3)
MAT 475	Differential Equations (3)
MAT 476	Partial Differential Equations (3)

Discrete Mathematics

MAT 415	Introduction to Combinatorics (3)
MAT 416	Introduction to Graph Theory (3)
MAT 419	Introduction to Linear Programming <i>CS</i> (3)

Statistics and Probability

STP 420	Introductory Applied Statistics <i>CS</i> (3)
STP 421	Probability (3)
STP 425	Stochastic Processes (3)
STP 427	Mathematical Statistics (3)
STP 429	Experimental Statistics <i>CS</i> (3)

Additional Course Work in Mathematics and Statistics

Three courses in mathematics and statistics¹.....9

Related Field Course Work

Twelve hours of course work in mathematics, statistics, or related fields².....12

¹ Acceptable mathematics courses are MAT 274 and upper-division MAT courses, with the exception of MAT 362, 485, and ASU West MAT 411. Acceptable statistics courses are upper-division STP courses.

² See “Related Field Course List,” page 401.

MATHEMATICS—B.S.

The Department of Mathematics has two avenues for earning a B.S. degree. The B.S. requirements are similar to the B.A. requirements, but they require more extensive courses in advanced mathematics. The program is flexible enough to allow students to focus their studies on mathematics, applied mathematics, or statistics. The computational mathematical sciences concentration is an interdisciplinary program with significant components of computer science, physical and biological sciences, and mathematics and statistics. The requirements for the B.S. degree and for the B.S. degree with the computational mathematical sciences concentration are distinct; neither is a subset of the other.

B.S. Requirements. The B.S. degree in Mathematics requires a minimum of 42 semester hours of course work in mathematics and statistics, and additional course work in closely related fields, for a total of 55 semester hours. A grade of “C” or higher is required in all courses taken for the major. MAT 370 and 371 may not both be used to satisfy these degree requirements. The required course work has the following components:

Core Courses

MAT 270	Calculus with Analytic Geometry I <i>MA</i>	4
MAT 271	Calculus with Analytic Geometry II <i>MA</i>	4
MAT 272	Calculus with Analytic Geometry III <i>MA</i>	4
MAT 300	Mathematical Structures <i>L</i>	3
MAT 342	Linear Algebra	3
MAT 371	Advanced Calculus I	3
Total		21

Computer Science Requirement

CSE 200	Concepts of Computer Science <i>CS</i>	3
Total		3

Depth Requirement

Two courses chosen from the following list of advanced courses.....6

MAT 423	Numerical Analysis I <i>CS</i> (3)
MAT 425	Numerical Analysis II <i>CS</i> (3)
MAT 442	Advanced Linear Algebra (3)
MAT 444	Intermediate Abstract Algebra (3)
MAT 462	Applied Partial Differential Equations (3)
MAT 472	Intermediate Real Analysis (3)
MAT 475	Differential Equations (3)
MAT 476	Partial Differential Equations (3)
STP 421	Probability (3)
STP 427	Mathematical Statistics (3)

Advanced Courses in Mathematics and Statistics¹

Two courses from the following list, both preferably taken from the same grouping.....6

Algebra, Topology, and Number Theory

MAT 410	Introduction to General Topology (3)
MAT 442	Advanced Linear Algebra (3)

MAT 443 Introduction to Abstract Algebra (3)
 MAT 444 Intermediate Abstract Algebra (3)
 MAT 445 Theory of Numbers (3)

Analysis and Applications
 MAT 372 Advanced Calculus II (3)
 MAT 461 Applied Complex Analysis (3)
 MAT 472 Intermediate Real Analysis (3)

Applied Mathematics and Dynamics
 MAT 451 Mathematical Modeling CS (3)
 MAT 452 Introduction to Chaos and Nonlinear Dynamics (3)
 MAT 455 Introduction to Fractals and Applications (3)

Computational Mathematics
 MAT 420 Scientific Computing (3)
 MAT 421 Applied Computational Methods CS (3)
 MAT 423 Numerical Analysis I CS (3)
 MAT 425 Numerical Analysis II CS (3)
 MAT 427 Computer Arithmetic CS (3)

Differential Equations
 MAT 462 Applied Partial Differential Equations (3)
 MAT 475 Differential Equations (3)
 MAT 476 Partial Differential Equations (3)

Discrete Mathematics
 MAT 415 Introduction to Combinatorics (3)
 MAT 416 Introduction to Graph Theory (3)
 MAT 419 Introduction to Linear Programming CS (3)

Statistics and Probability
 STP 420 Introductory Applied Statistics CS (3)
 STP 421 Probability (3)
 STP 425 Stochastic Processes (3)
 STP 427 Mathematical Statistics (3)
 STP 429 Experimental Statistics CS (3)

Additional Course Work in Mathematics and Statistics²
 Three courses in mathematics and statistics9

Related Fields Course Work³
 Ten hours of course work in mathematics, statistics,
 or related fields is required10

¹ Students who contemplate graduate work in mathematics should choose additional courses listed under the depth requirement to satisfy the advanced courses requirement.
² Acceptable mathematics courses are MAT 274 and upper division MAT courses, with the exception of MAT 310, 362, 485, and ASU West MAT 411. Acceptable statistics courses are 400-level STP courses.
³ See "Related Field Course List," page 401.

Computational Mathematical Sciences Concentration Requirements. The B.S. degree in Mathematics with the computational mathematical sciences concentration requires a minimum of 36 semester hours of course work in mathematics and statistics, plus a minimum of 21 semester hours in physics, computer science, and other sciences for a minimum of 57 semester hours of course work related to the major. A grade of "C" or higher is required in all courses taken for the major. MAT 370 and 371 may not be used to satisfy these degree requirements. The required course work has the following components:

Core Courses
 MAT 270 Calculus with Analytic Geometry I MA4
 MAT 271 Calculus with Analytic Geometry II MA4

MAT 272 Calculus with Analytic Geometry III MA4
 MAT 274 Elementary Differential Equations MA3
 MAT 300 Mathematical Structures L3
 MAT 342 Linear Algebra3
 Total21

Computer Science Requirement
 CSE 200 Concepts of Computer Science CS3
 CSE 210 Object-Oriented Design and Data Structures CS3
 CSE 310 Data Structures and Algorithms3
 MAT 420 Scientific Computing3
 Total12

Physics Requirement
 Two semesters of introductory physics as shown 6 or 8
 PHY 121 University Physics I: Mechanics SQ (3)*
 or PHY 151 Physics II SQ (4)
 PHY 131 University Physics II: Electricity and
 Magnetism SQ (3)*
 or PHY 150 Physics I SQ (4)

* It is highly recommended that students taking PHY 121 and 131 also take the associated laboratory courses PHY 122 and 132.

Advanced Courses in Mathematics and Statistics
 Choose one course from each of the following four groups12

Group One
 MAT 371 Advanced Calculus I (3)
 MAT 460 Vector Calculus (3)

Group Two
 MAE 471 Computational Fluid Dynamics (3)
 or other course as approved by an advisor
 MAT 419 Introduction to Linear Programming CS (3)
 MAT 421 Applied Computational Methods CS (3)
 MAT 423 Numerical Analysis I CS (3)
 MAT 425 Numerical Analysis II CS (3)
 STP 429 Experimental Statistics CS (3)

Group Three
 MAT 372 Advanced Calculus II (3)
 MAT 427 Computer Arithmetic CS (3)
 MAT 451 Mathematical Modeling CS (3)
 MAT 452 Introduction to Chaos and Nonlinear Dynamics (3)
 MAT 461 Applied Complex Analysis (3)
 MAT 462 Applied Partial Differential Equations (3)
 MAT 475 Differential Equations (3)
 STP 420 Introductory Applied Statistics CS (3)
 STP 421 Probability (3)
 One course not already chosen from *Group One* or *Two* (3)

Group Four
 One course from either *Group One, Two, or Three*, or any other 400-level MAT or STP course except for MAT 485, and ASU West MAT 411 (3)

Second Science
 Choose among the course combinations below for a one-year sequence in another other science, chosen from astronomy, biology, geology, or chemistry¹6-9
 AST 321 Introduction to Planetary and Stellar
 Astrophysics SQ² (3)
 AST 322 Introduction to Galactic and Extragalactic
 Astrophysics SQ² (3)
 _____or_____

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

BIO 181	General Biology	<i>SQ</i>	(4)
BIO 182	General Biology	<i>SG</i>	(4)
— <i>or</i> —			
GLG 101	Introduction to Geology I (Physical)	<i>SQ</i> , ³ <i>G</i>	(3)
GLG 102	Introduction to Geology II (Historical)	<i>SG</i> , ⁴ <i>H</i>	(3)
— <i>or</i> —			

Any two of CHM 113, 114, 115, 116, 117, and 118 as permitted by the Department of Chemistry and Biochemistry.⁵

- ¹ Other course combinations may be used upon approval of a departmental advisor.
- ² Both AST 113 and 321 or both AST 114 and 322 must be taken to secure *SQ* credit.
- ³ Both GLG 101 and 103 must be taken to secure *SQ* credit.
- ⁴ Both GLG 102 and 104 must be taken to secure *SG* credit.
- ⁵ See the individual course listings for restrictions.

Advanced Science Course or Internship

One advanced course in a science for which a one-year course sequence in the same science is required, or an internship, subject to advisor approval¹3

MAT 484 Internship (3)

Any upper-division course in plant biology (PLB), chemistry (CHM), or microbiology (MIC) (3)

Any upper-division science or engineering course from the related field course list² (3)

- ¹ Other courses may be used to satisfy this requirement with the approval of a Department of Mathematics advisor.
- ² Note that courses with prefixes ECN, FIN, MAT, PHI, and STP do not count toward this requirement. See “Related Field Course List,” page 401.

Statistics. Students interested in concentrating their mathematical studies on statistics should satisfy the requirements for a B.S. degree in Mathematics with the following courses. A grade of “C” or higher is required in all courses taken for the major. MAT 370 and 371 may not be used to satisfy these degree requirements.

Core Courses

MAT 270	Calculus with Analytic Geometry I	<i>MA</i>	.....4
MAT 271	Calculus with Analytic Geometry II	<i>MA</i>	.....4
MAT 272	Calculus with Analytic Geometry III	<i>MA</i>	.....4
MAT 300	Mathematical Structures	<i>L</i>	.....3
MAT 342	Linear Algebra		.....3
MAT 371	Advanced Calculus I		.....3
STP 420	Introductory Applied Statistics	<i>CS</i>	.....3
STP 421	Probability		.....3
STP 427	Mathematical Statistics		.....3
STP 429	Experimental Statistics	<i>CS</i>	.....3
Total			.....33

Computer Science Requirement

CSE 200	Concepts of Computer Science	<i>CS</i>	.....3
Total			.....3

Additional Advanced Courses in Mathematics and Statistics

Three courses from the following list .....9			
MAT 274	Elementary Differential Equations	<i>MA</i>	(3)
MAT 372	Advanced Calculus II		(3)
MAT 423	Numerical Analysis I	<i>CS</i>	(3)
MAT 442	Advanced Linear Algebra		(3)
STP 425	Stochastic Processes		(3)

Required Related Field Course Work

Statistics/probability, mathematics, or related fields*10

* See “Related Field Course List,” page 401.

Actuarial Science. The faculty in the Department of Mathematics offer courses that cover the content of the mathematical examinations of the Society of Actuaries. See the department’s actuarial advisor for more information.

MINOR IN MATHEMATICS

The minor in Mathematics consists of a minimum of 20 semester hours. Required courses are as follows:

MAT 271	Calculus with Analytic Geometry II	<i>MA</i>	.....4
MAT 272	Calculus with Analytic Geometry III	<i>MA</i>	.....4
MAT 342	Linear Algebra		.....3
Total			.....11

Electives must be upper-division courses in mathematics (MAT) or Statistics and Probability (STP). Students may not apply MAT 362, 485, or a course not offered at ASU’s main campus to the math minor, unless otherwise approved by a math department advisor.

SECONDARY EDUCATION—B.A.E.

Mathematics. Students pursuing the major teaching field may choose from two options.

Option One. With this option, the academic specialization consists of the following required courses:

CSE 100	Principles of Programming with C++	<i>CS</i>	.....3
	or CSE 183 Applied Problem Solving with FORTRAN	<i>CS</i>	(3)
	or CSE 200 Concepts of Computer Science	<i>CS</i>	(3)
MAT 270	Calculus with Analytic Geometry I	<i>MA</i>	.....4
MAT 271	Calculus with Analytic Geometry II	<i>MA</i>	.....4
MAT 272	Calculus with Analytic Geometry III	<i>MA</i>	.....4
MAT 300	Mathematical Structures	<i>L</i>	.....3
MAT 310	Introduction to Geometry		.....3
MAT 342	Linear Algebra		.....3
MAT 370	Intermediate Calculus		.....3
	or MAT 371 Advanced Calculus I		(3)
MAT 443	Introduction to Abstract Algebra		.....3
	or MAT 445 Theory of Numbers		(3)
MTE 483	Mathematics in the Secondary School		.....3
STP 420	Introductory Applied Statistics	<i>CS</i>	.....3
Total			.....36

The methods in academic specialization courses for mathematics are MTE 482 Methods of Teaching Mathematics in Secondary School and MTE 494 Special Topics: Advanced Methods of Teaching Secondary Mathematics. They are required as part of the Professional Teacher Preparation Program (PTPP) but cannot be counted as part of the 36-hour major requirement.

Option Two. This option may be exercised only in combination with option two under “Chemistry,” page 347, or “Physics,” page 421. The program consists of 30 semester hours in mathematics. Required courses are as follows:

MAT 270	Calculus with Analytic Geometry I	<i>MA</i>	.....4
MAT 271	Calculus with Analytic Geometry II	<i>MA</i>	.....4

MAT 272 Calculus with Analytic Geometry III MA	4
MAT 300 Mathematical Structures L	3
MAT 310 Introduction to Geometry	3
MAT 342 Linear Algebra	3
MAT 370 Intermediate Calculus MA	3
or MAT 371 Advanced Calculus I (3)	
or MAT 460 Vector Calculus (3)	
MAT 443 Introduction to Abstract Algebra	3
Total	27

Recommended

CSE 100 Principles of Programming with C++ CS	3
or CSE 200 Concepts of Computer Science CS (3)	

Minor Teaching Field. The minor teaching field is a minor in mathematics for presecondary teachers, consisting of the following required courses:

MAT 271 Calculus with Analytic Geometry II MA	4
MAT 272 Calculus with Analytic Geometry III MA	4
MAT 300 Mathematical Structures L	3
MAT 310 Introduction to Geometry	3
MAT 342 Linear Algebra	3
MAT 370 Intermediate Calculus	3
or MAT 371 Advanced Calculus I (3)	
Total	20

GRADUATE PROGRAMS

The faculty in the Department of Mathematics offer programs leading to the degrees of Master of Natural Science, M.A., and Ph.D. See the *Graduate Catalog* for requirements.

MATHEMATICS (MAT)**MAT 106 Intermediate Algebra. (3)**

fall, spring, summer

Topics from basic algebra such as linear equations, polynomials, factoring, exponents, roots, and radicals. Prerequisite: 1 year of high school algebra.

MAT 114 College Mathematics. (3)

fall, spring, summer

Applications of basic college-level mathematics to real-life problems. Appropriate for students whose major does not require MAT 117 or 170. Prerequisite: MAT 106 or 2 years of high school algebra.

General Studies: MA

MAT 117 College Algebra. (3)

fall, spring, summer

Linear and quadratic functions, systems of linear equations, logarithmic and exponential functions, sequences, series, and combinatorics. Prerequisite: MAT 106 or 2 years of high school algebra.

General Studies: MA

MAT 119 Finite Mathematics. (3)

fall, spring, summer

Topics from linear algebra, linear programming, combinatorics, probability, and mathematics of finance. Prerequisite: MAT 117 (or its equivalent).

General Studies: MA

MAT 170 Precalculus. (3)

fall, spring, summer

Intensive preparation for calculus (MAT 260, 270, and 290). Topics include functions (including trigonometric), matrices, polar coordinates, vectors, complex numbers, and mathematical induction. Prerequisite with a grade of "B" or higher: MAT 106. Prerequisite with a grade of "C" or higher: MAT 117 or two years of high school algebra.

General Studies: MA

MAT 210 Brief Calculus. (3)

fall, spring, summer

Differential and integral calculus of elementary functions with applications. Not open to students with credit for MAT 260, 270, or 290. Prerequisite: MAT 117 (or its equivalent).

General Studies: MA

MAT 242 Elementary Linear Algebra. (2)

fall, spring, summer

Introduction to matrices, systems of linear equations, determinants, vector spaces, linear transformations, and eigenvalues. Emphasizes development of computational skills. Prerequisite: 1 semester of calculus or instructor approval.

MAT 243 Discrete Mathematical Structures. (3)

fall, spring, summer

Logic, sets, functions, elementary number theory and combinatorics, recursive algorithms, and mathematical reasoning, including induction. Emphasizes connections to computer science. Prerequisite: 1 semester of calculus or computer programming.

MAT 251 Calculus for Life Sciences. (3)

fall and spring

Differential and integral calculus of elementary functions. Introduction to differential and difference equations. Emphasis on applications to the life sciences. Not open to students with credit for MAT 210, 260, or 270. Prerequisite: MAT 170 (or its equivalent).

General Studies: MA

MAT 260 Technical Calculus I. (3)

not regularly offered

Analytic geometry, differential, and integral calculus of elementary functions, emphasizing physical interpretation and problem solving. Not open to students with credit for MAT 210, 270, or 290. Prerequisite: MAT 170 (or its equivalent).

General Studies: MA

MAT 261 Technical Calculus II. (3)

not regularly offered

Continuation of MAT 260. Prerequisite: MAT 260 or instructor approval.

General Studies: MA

MAT 262 Technical Calculus III. (3)

not regularly offered

Infinite series, an introduction to differential equations and elementary linear algebra. Prerequisite: MAT 261 (or its equivalent).

General Studies: MA

MAT 270 Calculus with Analytic Geometry I. (4)

fall, spring, summer

Real numbers, limits and continuity, and differential and integral calculus of functions of 1 variable. Not open to students with credit for MAT 290. The sequence MAT 270 and 271 may be substituted for MAT 290 to satisfy requirements of any curriculum. Prerequisite with a grade of "C" or higher: MAT 170 or satisfactory score on placement examination.

General Studies: MA

MAT 271 Calculus with Analytic Geometry II. (4)

fall, spring, summer

Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, sequences, and series. Not open to students with credit for MAT 291. The sequence MAT 270, 271, 272 may be substituted to satisfy requirements for MAT 290 and 291. Prerequisite with a grade of "C" or higher: MAT 270 (or its equivalent).

General Studies: MA

MAT 272 Calculus with Analytic Geometry III. (4)

fall, spring, summer

Vector-valued functions of several variables, multiple integration, and introduction to vector analysis. The sequence MAT 270, 271, 272 may be substituted to satisfy requirements for MAT 290 and 291. Prerequisite with a grade of "C" or higher: MAT 271 (or its equivalent).

General Studies: MA

MAT 274 Elementary Differential Equations. (3)

fall, spring, summer

Introduction to ordinary differential equations, adapted to the needs of students in engineering and the sciences. MAT 272 (or its equivalent) is recommended. Prerequisite: MAT 271 (or its equivalent).

General Studies: MA

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MAT 290 Calculus I. (5)*not regularly offered*

Differential and integral calculus of elementary functions; topics from analytic geometry essential to the study of calculus. Prerequisite: MAT 170 (or its equivalent).

*General Studies: MA***MAT 291 Calculus II. (5)***not regularly offered*

Further applications of calculus, partial differentiation, multiple integrals, and infinite series. Prerequisite: MAT 290 (or its equivalent).

MAT 294 Special Topics. (1–4)*not regularly offered***MAT 300 Mathematical Structures. (3)***fall and spring*

Logic and set theory, induction, functions, order and equivalence relations, cardinality. Emphasis on writing proofs. Prerequisite: 1 semester of calculus or instructor approval.

*General Studies: L***MAT 310 Introduction to Geometry. (3)***spring*

Congruence, area, parallelism, similarity and volume, and Euclidean and non-Euclidean geometry. Prerequisite: MAT 272 (or its equivalent).

MAT 342 Linear Algebra. (3)*fall, spring, summer*

Linear equations, matrices, determinants, vector spaces, bases, linear transformations and similarity, inner product spaces, eigenvectors, orthonormal bases, diagonalization, and principal axes. Pre- or corequisite: MAT 272 (or its equivalent).

MAT 351 Mathematical Methods for Genetic Analysis. (3)*fall and spring*

Discrete mathematics, probability, statistics, and associated computer packages. Applications to genomics, bioinformatics, forensics, and DNA/protein sequence patterns. Prerequisite: MAT 251 or 270 or instructor approval.

*General Studies: CS***MAT 362 Advanced Mathematics for Engineers and Scientists. (3)***fall, spring, summer*

Vector analysis, Fourier analysis, and partial differential equations. Prerequisites: MAT 272 and 274 (or their equivalents).

MAT 370 Intermediate Calculus. (3)*fall and spring*

Theory behind basic 1-variable calculus: continuity, derivative, Riemann integral, sequences, and series. Not open to students who have received a "C" or higher in MAT 371. Students may not count both MAT 370 and 371 toward a mathematics degree. Prerequisites: MAT 272, 300.

MAT 371 Advanced Calculus I. (3)*fall and spring*

Real numbers, completeness, sequences/series, continuity, uniform theorems, derivative, Riemann integral, pointwise/uniform convergence, Taylor's theorem. Students may not count both MAT 370 and 371 toward a mathematics degree. Prerequisite: MAT 272 or 300 or instructor approval.

MAT 372 Advanced Calculus II. (3)*spring*

Open, closed, compact sets in \mathbb{R}^n continuity, differentiation, partial differentiation, integration in \mathbb{R}^n . Inverse/implicit function theorems. Not open to students with credit for MAT 460. Prerequisite: MAT 371. Pre- or corequisite: MAT 342.

MAT 410 Introduction to General Topology. (3)*once a year*

Topological spaces, metric spaces, compactness, connectedness, and product spaces. Prerequisite: MAT 300 or 371 or instructor approval.

MAT 415 Introduction to Combinatorics. (3)*fall*

Topics include proof techniques, permutations, combinations; counting techniques including recurrence relations, generating functions, inclusion-exclusion; Ramsey theory and combinatorial designs. Prerequisites: both MAT 300 (or 243) and 342 (or 242) or only instructor approval.

MAT 416 Introduction to Graph Theory. (3)*spring*

Topics include trees, cycles, matchings, planarity, connectivity, Hamiltonicity, colorings, graph algorithms, and other advanced topics. Prerequisites: both MAT 300 (or 243) and 342 (or 242) or only instructor approval.

MAT 419 Introduction to Linear Programming. (3)*spring*

Simplex method, duality, and network flows. Applications to game theory, geometry, combinatorics, graph theory, and posets. Prerequisites: a combination of CSE 100 (or 200 or 210) and MAT 300 (or 243) and 342 (or 242) or only instructor approval.

*General Studies: CS***MAT 420 Scientific Computing. (3)***fall*

Survey and application of programming languages, libraries, and scientific visualization tools. Programming assignments emphasize software development skills. Lecture, lab. Prerequisites: a combination of CSE 200 and MAT 274 and 342 (or their equivalents) or only instructor approval.

MAT 421 Applied Computational Methods. (3)*fall and spring*

Numerical methods for quadrature, differential equations, roots of non-linear equations, interpolation, approximation, linear equations, floating-point arithmetic, and roundoff error. Prerequisites: both MAT 271 (or its equivalent) and fluency in computer programming (preferably FORTRAN) or only instructor approval.

*General Studies: CS***MAT 423 Numerical Analysis I. (3)***fall*

Analysis and algorithms for numerical solutions linear/nonlinear equations, direct solvers, iterative procedures, optimization. Determination of eigenvalues. Elementary computer arithmetic. Prerequisites: a combination of MAT 342 and 371 and fluency in computer programming or only instructor approval.

*General Studies: CS***MAT 425 Numerical Analysis II. (3)***spring*

Analysis of and algorithms for numerical interpolation, integration, and differentiation. Numerical solution of ordinary differential equations, and method of lines. Those seeking a methods survey course should take MAT 421. Prerequisites: a combination of MAT 342 and 371 and fluency in computer programming or only instructor approval.

*General Studies: CS***MAT 427 Computer Arithmetic. (3)***not regularly offered*

Number systems, hardware/software arithmetic, overflow, significance, rounding, multiple precision, and automatic error control; impact on languages, architectures, robust programming, and software development. Prerequisite: only CSE 100 (or 200) or both MAT 421 and 423 (or 425) or only instructor approval.

*General Studies: CS***MAT 442 Advanced Linear Algebra. (3)***fall*

Fundamentals of linear algebra, dual spaces, invariant subspaces, canonical forms, bilinear and quadratic forms, and multilinear algebra. Prerequisites: both MAT 300 and 342 or only instructor approval.

MAT 443 Introduction to Abstract Algebra. (3)*fall*

Introduction to concepts of abstract algebra. Not open to students with credit for MAT 444. Prerequisites: both MAT 300 and 342 or only instructor approval.

MAT 444 Intermediate Abstract Algebra. (3)*spring*

Basic theory of groups, rings, and fields, including an introduction to Galois theory. Appropriate as preparation for MAT 543. Prerequisite: MAT 443 or graduate standing or instructor approval.

MAT 445 Theory of Numbers. (3)*spring*

Prime numbers, unique factorization theorem, congruences, Diophantine equations, primitive roots, and quadratic reciprocity theorem. Prerequisites: both MAT 300 and 342 or only instructor approval.

MAT 447 Cryptography. (3)*fall and spring*

Block ciphers, stream ciphers, congruence arithmetic, information theory, public key cryptosystems, key exchange, electronic signatures. Prerequisites: MAT 242 (or 342); 300.

MAT 451 Mathematical Modeling. (3)*spring*

Detailed study of 1 or more mathematical models that occur in the physical or biological sciences. May be repeated for credit with instructor approval. Prerequisites: both MAT 242 (or 342) and 274 or only instructor approval.

*General Studies: CS***MAT 452 Introduction to Chaos and Nonlinear Dynamics. (3)***fall*

Properties of nonlinear dynamical systems; dependence on initial conditions; strange attractors; period doubling; bifurcations; symbolic dynamics; Smale-Birkhoff theorem; and applications. MAT 371 is recommended. Prerequisites: MAT 274, 342 (or 242).

MAT 455 Introduction to Fractals and Applications. (3)*spring*

Fractals; self-similar structures, fractals with iterated function systems of maps, computing fractals, fractal dimensions, chaotic dynamics on fractals, applications. MAT 371 is recommended. Prerequisites: MAT 274, 342 (or 242).

MAT 460 Vector Calculus. (3)*spring*

Vectors, curvilinear coordinates, Jacobians, implicit function theorem, line and surface integrals, Green's, Stokes', and divergence theorems. Not open to students with credit for MAT 372. Prerequisites: MAT 242 (or 342), 272, 274.

MAT 461 Applied Complex Analysis. (3)*fall and summer*

Analytic functions, complex integration, Taylor and Laurent series, residue theorem, conformal mapping, and harmonic functions. Prerequisite: MAT 272 (or its equivalent).

MAT 462 Applied Partial Differential Equations. (3)*spring*

Second-order partial differential equations, emphasizing Laplace, wave, and diffusion equations. Solutions by the methods of characteristics, separation of variables, and integral transforms. Prerequisites: MAT 242 (or 342), 274.

MAT 472 Intermediate Real Analysis. (3)*fall*

Introduction to analysis in metric spaces with emphasis on the real line. Appropriate as preparation for MAT 570. Prerequisites: MAT 300, 342.

MAT 475 Differential Equations. (3)*fall*

Asymptotic behavior of solutions of linear and nonlinear ordinary differential equations, stability, Sturm-Liouville problems, boundary value problems, and singular point behavior of autonomous systems. Prerequisites: MAT 242 (or 342), 274.

MAT 476 Partial Differential Equations. (3)*spring*

First-order quasilinear, second-order linear (wave, Laplace, heat). Characteristics, harmonic functions, maximum principles, Fourier series, separation of variables. Prerequisites: MAT 274 (or 475), 372 (or 472).

MAT 484 Internship. (1–12)*not regularly offered***MAT 485 History of Mathematics. (3)***not regularly offered*

Topics from the history of the origin and development of mathematical ideas. Prerequisite: MAT 272 (or its equivalent).

MAT 505 Perturbation Methods. (3)*not regularly offered*

Nonlinear oscillations, strained coordinates, renormalization, multiple scales, boundary layers, matched asymptotic expansions, turning point problems, and WKBJ method. Cross-listed as MAE 505. Credit is allowed for only MAE 505 or MAT 505.

MAT 514 Enumerative Combinatorics I. (3)*fall*

First semester of a systematic development of enumerative combinatorics including: elementary counting techniques, sieve methods, and partially ordered sets. Prerequisite: graduate standing or instructor approval.

MAT 515 Enumerative Combinatorics II. (3)*spring*

Second semester of a systematic development of enumerative combinatorics including: lattices, exponential structures, symmetric functions, and selected special topics. Prerequisite: MAT 514 or instructor approval.

MAT 516 Graph Theory I. (3)*fall*

First semester of a systematic development of graph theory including: matchings, connectivity, arboricity, planarity, coloring, network flows. Prerequisite: graduate standing or instructor approval.

MAT 517 Graph Theory II. (3)*spring*

Second semester of a systematic development of graph theory including: dense and sparse graphs, Ramsey theory, hamiltonicity, random graphs, minors. Prerequisite: MAT 516 or instructor approval.

MAT 518 Combinatorial Optimization I. (3)*fall*

First semester of a systematic development of combinatorial optimization including: linear programming, duality, primal-dual algorithms, network flow algorithms, weighted matchings. Prerequisite: graduate standing or instructor approval.

MAT 519 Combinatorial Optimization II. (3)*spring*

Second semester of a systematic development of combinatorial optimization including: matroid algorithms, theory of NP-completeness, polynomial time approximation, dynamic programming. Prerequisite: MAT 518 or instructor approval.

MAT 520 Numerical Linear Algebra. (3)*fall*

Direct solution of linear systems, iterative methods, eigenvalues and eigenvectors, singular value decomposition, the QR algorithm, error propagation, arithmetic, and stability. Prerequisites: both MAT 342 and 423 (or 421) or only instructor approval.

MAT 521 Iterative Methods. (3)*spring*

Numerical methods for solving linear/nonlinear systems of equations (symmetric, nonsymmetric). Iterative methods for linear systems, conjugate gradients, multigrid methods, preconditioning, Krylov methods. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 523 Numerical Optimization. (3)*not regularly offered*

Linear programming, unconstrained nonlinear minimization, line search algorithms, conjugate gradients, quasi-Newton methods, constrained nonlinear optimization, gradient projection, and penalty methods. Prerequisite: MAT 342 or 371 or 460 or 520 (or its equivalent) or instructor approval.

MAT 524 Parallel Numerical Algorithms. (3)*not regularly offered*

Algorithms for massively parallel, hypercube architectures; "parallel" FORTRAN; solution of linear, nonlinear systems; partial differential equations; iterative methods; multigrid; domain decomposition. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 530 Numerical Solution of Ordinary Differential Equations. (3)*fall*

One step, linear multistep methods; consistency, order, stability, convergence; discretization, roundoff errors, error estimation, adaptive strategy; implementation, software for nonstiff equations. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MAT 531 Numerical Solution of Stiff Differential Systems. (3)*spring*

Runge-Kutta methods, order conditions, construction of highly stable methods, order stars, error estimation, stepsize selection, contractivity properties, linear multistep methods. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 533 Computational Elliptic and Parabolic Partial Differential Equations. (3)*fall*

Parabolic and elliptic equations, finite difference, finite element methods, stability, consistency, convergence, practical aspects, applications, software. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 534 Computational Hyperbolic Partial Differential Equations. (3)*spring*

Numerical solutions of hyperbolic PDEs, finite difference methods, well-posedness, stability, consistency, convergence, adaptive grids; Maxwell's equations, elastic wave propagation; Navier-Stokes. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 535 Spectral Methods for Partial Differential Equations. (3)*not regularly offered*

Spectral, pseudospectral theory; Galerkin, collocation methods; Tau-methods, global approximation properties, stability; convergence; solutions for linear, nonlinear systems. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 543 Abstract Algebra. (3)*fall*

Groups, modules, rings and fields, Galois theory, homological algebra, and the representation theory. Prerequisite: MAT 444 or instructor approval.

MAT 544 Abstract Algebra. (3)*spring*

Continuation of MAT 543. Prerequisite: MAT 543 or instructor approval.

MAT 551 Linear Operators and Integral Equations. (3)*spring*

Bounded linear and compact operators on Hilbert spaces. Linear integral equations, Fredholm and Hilbert-Schmidt theory, and approximate methods. Distributions. Prerequisites: MAT 242 and 462 (or their equivalents).

MAT 555 Fractal Geometry. (3)*not regularly offered*

Geometry and analysis of fractal sets; definitions of dimensions; calculating dimensions; projections, products of fractals; random fractals; multifractal measures; and applications. Prerequisites: MAT 371, 455. MAT 472 is recommended.

MAT 560 Dynamical Systems Methods in Fluid Dynamics. (3)*fall*

Applications of modern dynamical systems methods to fluid mechanics: bifurcations, normal forms, nonlinear dynamics, pattern formation, mixing, and Lagrangian chaos. Prerequisite: graduate standing or instructor approval.

MAT 570 Real Analysis. (3)*spring*

Lebesgue integration, selected function spaces, differentiation, abstract measure theory, and elements of functional analysis. Prerequisite: MAT 372 or instructor approval.

MAT 571 Real Analysis. (3)*fall*

Continuation of MAT 570. Prerequisite: MAT 570 or instructor approval.

MAT 572 Complex Analysis. (3)*fall*

Analytic functions, series and product representations, entire and meromorphic functions, normal families, Riemann mapping theorem, harmonic functions, and Riemann surfaces. Prerequisite: MAT 371 or instructor approval.

MAT 573 Complex Analysis. (3)*spring*

Continuation of MAT 572. Prerequisite: MAT 572 or instructor approval.

MAT 574 Theory of Ordinary Differential Equations. (3)*not regularly offered*

Systems, existence proofs, singularities, asymptotic behavior of solutions, boundedness of solutions, eigenvalues and eigenfunctions, and perturbation theory. Prerequisite: MAT 372 or instructor approval.

MAT 575 Theory of Ordinary Differential Equations and Dynamical Systems. (3)*not regularly offered*

Geometric approach to ODEs and dynamical systems; (un)stable, center manifolds; structural stability; normal forms; averaging; chaos; persistence. May be repeated for credit with instructor approval. Prerequisites: both MAT 452 and 475 or only MAT 574 or only instructor approval.

MAT 576 Theory of Partial Differential Equations. (3)*not regularly offered*

Existence and uniqueness theorems, boundary value and initial value problems, characteristics, Green's functions, maximum principle, distributions, and weak solutions. Prerequisite: knowledge of Lebesgue integration or instructor approval.

MAT 577 Theory of Partial Differential Equations. (3)*not regularly offered*

Continuation of MAT 576. Prerequisite: MAT 576 or instructor approval.

MAT 578 Functional Analysis. (3)*not regularly offered*

Locally convex, normed, and Hilbert spaces. Linear operators, spectral theory, and application to classical analysis. Prerequisite: MAT 472 or 571 or instructor approval.

MAT 579 Functional Analysis. (3)*not regularly offered*

Continuation of MAT 578. Prerequisite: MAT 578 or instructor approval.

MAT 591 Seminar. (1–12)*not regularly offered*

Possible topics:

- Algebra. (1–3)
- Analysis. (1–3)
- Applied Mathematics. (1–3)
- Combinatorial Mathematics. (1–3)
- Mathematical Logic. (1–3)
- Numerical Analysis. (1–3)
- Topology. (1–3)

MATHEMATICS EDUCATION (MTE)**MTE 180 Theory of Elementary Mathematics. (3)***fall, spring, summer*

Number systems, intuitive geometry, elementary algebra, and measurement. Intended for prospective elementary school teachers. Prerequisite: MAT 117 (or its equivalent).

MTE 181 Theory of Elementary Mathematics. (3)*once a year*

Continuation of MTE 180. Prerequisite: MTE 180 or instructor approval.

MTE 380 Arithmetic in the Elementary School. (3)*once a year*

Historical numeration systems, overview of elementary number theory, including primes, factorization, divisibility, bases, modular systems, linear congruence, and continued fractions. Prerequisite: MTE 181 or instructor approval.

MTE 381 Geometry in the Elementary School. (3)*not regularly offered*

Informal geometry, including concepts of length, area, volume, similarity, and congruence. Classification of figures, straightedge and compass constructions, and motion geometry. Prerequisite: MTE 380 or instructor approval.

MTE 482 Methods of Teaching Mathematics in Secondary School. (3)*fall*

Examines secondary school curricular material and analyzes instructional devices. Teaching strategies, evaluative techniques, diagnosis, and remediation and problem solving. Prerequisite: instructor approval.

MTE 483 Mathematics in the Secondary School. (3)*spring*

Topics in geometry, number theory, algebra, and analysis. Emphasis on unifying principles. Prerequisite: MAT 310 or instructor approval.

MTE 484 Theory of Elementary Mathematics Internship. (3)*fall and spring*

Employs hands-on activities and manipulatives to advance mathematical understanding in second- to fourth-grade students.

MTE 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Advanced Methods of Teaching Secondary Mathematics. (3)
Continuation of MTE 482. Prerequisite: MTE 482.

MTE 585 Modern Geometry for Teachers. (3)*once a year*

Euclidean, projective, and non-Euclidean geometries. Prerequisite: instructor approval.

MTE 587 Analysis for Teachers. (3)*not regularly offered*

Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: instructor approval.

STATISTICS AND PROBABILITY (STP)**STP 220 Conceptual Statistics. (3)***fall and spring*

Treats the concepts and vocabulary needed to evaluate statistical reports on health, technology, and society. Aggressively emphasizes understanding over computation. Lecture, teamwork. Prerequisite: MAT 114 or 117 (or its equivalent).

*General Studies: CS***STP 226 Elements of Statistics. (3)***fall, spring, summer*

Basic concepts and methods of statistics, including descriptive statistics, significance tests, estimation, sampling, and correlation. Not open to majors in mathematics or the physical sciences. Prerequisite: MAT 114 or 117 (or its equivalent).

*General Studies: CS***STP 326 Intermediate Probability. (3)***fall and spring*

Probability models and computations, joint and conditional distributions, moments, and families of distributions. Topics in stochastic processes, simulation, and statistics. Prerequisite: MAT 210 (or its equivalent).

*General Studies: CS***STP 420 Introductory Applied Statistics. (3)***fall, spring, summer*

Introductory probability, descriptive statistics, sampling distributions, parameter estimation, tests of hypotheses, chi-square tests, regression analysis, analysis of variance, and nonparametric tests. Prerequisite: MAT 117 (or its equivalent).

*General Studies: CS***STP 421 Probability. (3)***fall*

Laws of probability, combinatorial analysis, random variables, probability distributions, expectations, moment-generating functions, transformations of random variables, and central limit theorem.

Prerequisites: MAT 272 and 300 and STP 420 (or their equivalents).

STP 425 Stochastic Processes. (3)*spring*

Markov chains, stationary distributions, pure jump processes, 2D order processes, and other topics in stochastic processes. Prerequisites: MAT 342; STP 421.

STP 427 Mathematical Statistics. (3)*spring*

Limiting distributions, interval estimation, point estimation, sufficient statistics, and tests of hypotheses. Prerequisites: STP 420, 421.

STP 429 Experimental Statistics. (3)*spring*

Statistical inference for controlled experimentation. Multiple regression, correlation, analysis of variance, multiple comparisons, and nonparametric procedures. Prerequisite: STP 420 (or its equivalent).

*General Studies: CS***STP 525 Advanced Probability. (3)***not regularly offered*

Measure-theoretic foundations of probability, distribution functions and characteristic functions, laws of large numbers and central limit theorems, conditional probabilities, martingales, and topics in stochastic processes. Prerequisites: both MAT 571 and STP 421 or only instructor approval.

STP 526 Theory of Statistical Linear Models. (3)*fall*

Multinormal distribution, distribution of quadratic forms, full and nonfull rank models, generalized inverses, unbalanced data, variance components, and the large sample theory. Prerequisites: STP 427; knowledge of matrix algebra.

STP 530 Applied Regression Analysis. (3)*fall*

Method of least squares, simple and multiple linear regression, polynomial regression, analysis of residuals, dummy variables, and model building. Prerequisite: STP 420 (or its equivalent).

STP 531 Applied Analysis of Variance. (3)*spring*

Factorial designs, balanced and unbalanced data, fixed and random effects, randomized blocks, Latin squares, analysis of covariance, and multiple comparisons. Prerequisite: STP 420 (or its equivalent).

STP 532 Applied Nonparametric Statistics. (3)*fall*

One-sample test, tests of 2 or more related or independent samples, measures of correlation, and tests of trend and dependence. Prerequisite: STP 420 (or its equivalent).

STP 533 Applied Multivariate Analysis. (3)*spring*

Discriminant analysis, principal components, factor analysis, cluster analysis, and canonical correlation. Prerequisite: STP 420 (or its equivalent).

STP 534 Applied Discrete Data Analysis. (3)*not regularly offered*

Models for discrete and count data, measures of association, and log-linear and regression models for contingency tables. Prerequisite: STP 420 (or its equivalent).

STP 535 Applied Sampling Methodology. (3)*spring*

Simple random, stratified, cluster sampling; variance estimation in complex surveys; nonparametric superpopulation approaches; nonresponse models; computational methods. Prerequisite: STP 420 (or its equivalent).

STP 591 Seminar. (1–12)*not regularly offered*

Possible topics:

- (a) Probability. (1–3)
(b) Statistics. (1–3)

STP 593 Applied Project. (1–12)*not regularly offered***STP 599 Thesis. (1–12)***not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Department of Microbiology

Edward A. Birge
Chair
(LSE 210) 480/965-1457
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PROFESSORS

BURKE, HARRINGTON, JACOBS, MOSSMAN, SCHMIDT

ASSOCIATE PROFESSORS

BIRGE, HOFFMAN, MISRA, STOUT

ASSISTANT PROFESSORS

CHANG, GARCIA-PICHEL

CLINICAL FACULTY

DOWNES, LEFEVRE, MASS, ROBERTS

MICROBIOLOGY—B.S.

The B.S. degree in Microbiology consists of a minimum of 41 semester hours in microbiology and approved related fields. Students majoring in Microbiology are required to take the following courses:

BIO 181 General Biology <i>SQ</i>	4
BIO 182 General Biology <i>SG</i>	4
BIO 340 General Genetics	4
Choose between the course combinations below	8
BCH 361 Principles of Biochemistry (3)	
BCH 367 Elementary Biochemistry Laboratory (1)	
CHM 231 Elementary Organic Chemistry <i>SQ</i> ¹ (3)	
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> ¹ (1)	
— or —	
CHM 331 General Organic Chemistry (3)	
CHM 332 General Organic Chemistry (3)	
CHM 335 General Organic Chemistry Laboratory (1)	
CHM 336 General Organic Chemistry Laboratory (1)	
MIC 206 Microbiology Laboratory <i>SG</i> ²	1
MIC 220 Biology of Microorganisms	3
MIC 302 Advanced Bacteriology Laboratory <i>L</i> ³	2
MIC 360 Bacterial Physiology	3
MIC 401 Research Paper <i>L</i> ³	1
Total	30

¹ Both CHM 231 and 235 must be taken to secure *SQ* credit.

² Both MIC 205 and 206 must be taken to secure *SG* credit.

³ Both MIC 302 and 401 must be taken to secure *L* credit.

A minimum of 11 semester hours of upper-division electives in microbiology or approved related fields must be taken.

These elective hours must include two courses chosen from the following:

MIC 421 Experimental Immunology	2
MIC 446 Techniques in Molecular Biology/Genetics Lab	2
MIC 470 Bacterial Diversity and Systematics	4
MIC 494 ST: Clinical Bacteriology Laboratory	3
MIC 495 Undergraduate Research	2

In addition, students are required to fulfill the university mathematical studies requirements with MAT 210 (or 270,

290, or 294) as their MA course and BIO 420 (or any CSE course that meets the CS requirement). The required supplemental courses are as follows:

CHM 113 General Chemistry <i>SQ</i>	4
CHM 115 General Chemistry with Qualitative Analysis <i>SQ</i>	5
PHY 111 General Physics <i>SQ</i> *	3
PHY 112 General Physics <i>SQ</i> *	3
PHY 113 General Physics Laboratory <i>SQ</i> *	1
PHY 114 General Physics Laboratory <i>SQ</i> *	1
Total	17

* Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure *SQ* credit.

CLINICAL LABORATORY SCIENCES—B.S.

The goal of the Clinical Laboratory Sciences degree program is to prepare individuals to practice in the field of clinical laboratory sciences, which includes the major disciplines of clinical chemistry, hematology, immuno-hematology, immunology, and microbiology. Employment opportunities exist in hospital, private, physician, and research laboratories and in government, sales, management, and education. After obtaining a B.S. degree in Clinical Laboratory Sciences, the graduate is eligible for national certification by examination.

A student majoring in Clinical Laboratory Sciences is required to take 40 hours of clinical laboratory sciences courses. Also required are the following courses:

BCH 361 Principles of Biochemistry	3
BIO 360 Animal Physiology	4
CHM 113 General Chemistry <i>SQ</i>	4
CHM 231 Elementary Organic Chemistry <i>SQ</i> ¹	3
MIC 205 Microbiology <i>SG</i> ²	3
or MIC 220 Biology of Microorganisms (3)	
MIC 206 Microbiology Laboratory <i>SG</i> ²	1
Total	18

¹ Both CHM 231 and 235 must be taken to secure *SQ* credit.

² Both MIC 205 and 206 must be taken to secure *SG* credit.

Equivalent courses may be substituted upon approval of an advisor. Students must consult with the clinical laboratory sciences advisor to select general electives courses. Completion of the degree is dependent upon acceptance of the student into the accredited professional study program, which consists of 40 hours of clinical laboratory sciences courses. The university does not guarantee all students to be accepted into the professional study program due to space limitations at the clinical affiliates and restrictions of program accreditation. For more information on acceptance procedures and program standards, contact the department for a program brochure. For proper course planning, students must meet with a clinical laboratory sciences advisor.

MINOR IN MICROBIOLOGY

The minor in Microbiology consists of a minimum of 24 semester hours. Required courses are as follows:

BIO 181 General Biology <i>SQ</i>	4
BIO 182 General Biology <i>SG</i>	4
BIO 340 General Genetics	4
MIC 206 Microbiology Laboratory <i>SG</i> ¹	1
MIC 220 Biology of Microorganisms	3

MIC 302 Advanced Bacteriology Laboratory L ²	2
MIC 360 Bacterial Physiology	3
Total	21

¹ Both MIC 205 and 206 must be taken to secure SG credit.

² Both MIC 302 and 401 must be taken to secure L credit.

The remaining upper-division microbiology courses are chosen in consultation with an advisor. Students majoring in Biology may not minor in Microbiology.

GRADUATE PROGRAMS

The faculty in the Department of Microbiology offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the *Graduate Catalog* for requirements.

The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. See the *Graduate Catalog* for courses, faculty, and program information, or call 480/965-0743 for more information.

CLINICAL LABORATORY SCIENCES/ MEDICAL TECHNOLOGY (CLS)

CLS 100 Introduction to Clinical Laboratory Sciences. (1)

fall

Introduction to the field of clinical laboratory sciences. Required for Clinical Laboratory Sciences majors.

CLS 310 Principles of Clinical Chemistry I. (6)

spring

Theory and application of principles of clinical chemistry, with emphasis on laboratory techniques, pathophysiology, methods of analysis, and assessment of procedure. 3 hours lecture, 9 hours lab. Fee. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 320 Principles of Clinical Microbiology I. (6)

spring

Theory and application of principles of clinical microbiology with emphasis on isolation and identification of medically significant fungi and bacteria. 3 hours lecture, 9 hours lab. Fee. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 330 Principles of Clinical Hematology I/Body Fluids. (3)

fall

Theory and application of principles in hematology, with emphasis on techniques to evaluate blood dyscrasias and analyze body fluids. 2 hours lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 410 Principles of Clinical Chemistry II. (2)

summer

Continuation of CLS 310 with emphasis on principles of advanced clinical chemistry. 1 hour lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 411 Advanced Applications of Clinical Chemistry. (4)

fall

Clinical application of theory/techniques from CLS 310 and 410. Emphasis on operation of common laboratory instrumentation and clinical correlation. Minimum 180 hours practicum. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 420 Principles of Microbiology II. (2)

summer

Disease mechanisms and identification of medically significant parasites, Mycobacteria, Actinomycetes, Chlamydia, Rickettsia, Mycoplasma, and viruses. 1 hour lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 421 Advanced Applications of Clinical Microbiology. (4)

spring

Practical laboratory application of the principles of specimen collection, processing, detection, identification, and antimicrobial testing of medically significant bacteria, fungi, and parasites. Minimum 180 hours practicum. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 430 Principles of Clinical Hematology II/Hemostasis. (3)

fall

Theory and applications of principles in hematology with emphasis on etiology, pathophysiology, clinical manifestations, and treatment of blood dyscrasias/hemostatic defects. 2 hours lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 431 Advanced Applications of Clinical Hematology. (4)

spring

Practical laboratory application of methods/techniques used to evaluate and diagnose blood dyscrasias/hemostatic defects. Applied techniques in body fluid analysis. Minimum 180 hours practicum. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 440 Principles of Clinical Immunology/Immunohematology. (4)

fall

Theoretical and practical application of clinical immunology and immunohematology. Emphasizes serological techniques that aid disease diagnosis and blood donor selection. 3 hours lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 441 Advanced Applications of Clinical Immunology/Immunohematology. (3)

spring

Practical laboratory application of the principles of serological methods used in diagnosing disease and selecting blood components for transfusion therapy. Minimum 135 hours practicum. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 450 Principles of Clinical Laboratory Administration. (2)

fall and spring

Principles of management, with emphasis on the clinical laboratory. Basic management process, personnel supervision, identification, and allocation of resources. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

General Studies: L (if credit also earned in CLS 460)

CLS 460 Principles of Clinical Laboratory Education. (1)

spring

Principles of learning, with application to the development of instructional objectives, strategies, and evaluation for teaching-learning situations in the laboratory. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

General Studies: L (if credit also earned in CLS 450)

MICROBIOLOGY (MIC)

MIC 205 Microbiology. (3)

fall, spring, summer

Basic course for students without credit in BIO 181, emphasizing general principles; role of microorganisms in health, ecology, and applied fields. May not be used for Microbiology major credit unless a diagnostic test is passed. Prerequisites: both BIO 100 (or PLB 108) and CHM 101 or only instructor approval.

General Studies: SG (if credit also earned in MIC 206)

MIC 206 Microbiology Laboratory. (1)

fall, spring, summer

Principles and laboratory techniques used in identifying and handling microorganisms. 3 hours lab. Fee. Pre- or corequisite: MIC 205 or 220.

General Studies: SG (if credit also earned in MIC 205)

MIC 220 Biology of Microorganisms. (3)

fall and spring

Basic course for students with credit in BIO 181. Detailed study of microbial cells, their structure, genetics, physiology, and taxonomy. Corequisites: BIO 182; CHM 115.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MIC 302 Advanced Bacteriology Laboratory. (2)*fall and spring*

Advanced laboratory techniques in bacterial growth, physiology, genetics, and microscopy. Required of Microbiology majors. 4 hours lab. Fee. Prerequisites: completion of General Studies L requirement and either A or B. (A) MIC 206 and 220 or (B) MIC 205 and 206 and instructor approval.

General Studies: L (if credit also earned in MIC 401)

MIC 360 Bacterial Physiology. (3)*fall and spring*

Mechanisms and control of cell metabolism, structures, and functions. Prerequisite: MIC 220. Pre- or corequisite: BCH 361 or instructor approval.

MIC 380 Medical Parasitology. (3)*fall*

Parasitic diseases of humans, including life cycle events and clinical manifestations. Prerequisite: MIC 205 or 220.

MIC 381 Pathogenic Microbes. (3)*spring*

Host-microbial interactions in infectious disease, with emphasis on pathogenesis, host defenses, and molecular mechanisms of microbial virulence. Prerequisite: MIC 360 or 6 hours in microbiology with instructor approval.

MIC 401 Research Paper. (1)*fall, spring, summer*

Paper of 15 or more pages based on library or laboratory research in collaboration with a faculty member. Required of all Microbiology majors. Prerequisites: MIC 302; completion of General Studies L requirement.

General Studies: L (if credit also earned in MIC 302)

MIC 420 Immunology: Molecular and Cellular Foundations. (3)*fall*

Molecular and cellular foundations of immunology. Antibody/antigen interactions, cellular response, cytokines, immunogenetics, immunoregulation, autoimmunity, psychoneuroimmunology research/medical perspectives. Prerequisites: both CHM 231 (or 331) and MIC 205 (or 220) or only instructor approval.

MIC 421 Experimental Immunology. (2)*fall and spring*

Introduction to the basic techniques, methods, and assays used in immunology. 6 hours lab. Fee. Prerequisites: a combination of CHM 231 and 331 and MIC 302 or only instructor approval.

MIC 425 Advanced Immunology. (3)*spring in odd years*

Survey of recent advances in immunology, including lymphocyte membranes, lymphokines/biochemistry, molecular genetics, theoretical immunology, immunoregulation, neuroimmunology, and immunologic diseases. Prerequisite: MIC 420 or instructor approval.

MIC 441 Bacterial Genetics. (3)*spring*

Survey of genetic exchange and regulatory processes in bacteria and their viruses. Bacteria and viruses as tools in genetic engineering. Prerequisites: both BIO 340 and MIC 205 (or 220) or only instructor approval.

MIC 442 Bacterial Genetics Laboratory. (1)*not regularly offered*

Techniques of mutagenesis, mapping, and strain and genetic library construction. 4 hours lab. Prerequisites: MIC 206, 302. Pre- or corequisite: MIC 441.

MIC 445 Techniques in Molecular Biology/Genetics. (2)*fall and spring*

Molecular genetic principles: plasmid construction, purification, and characterization; PCR; mutageneses; hybridization and sequence analysis; protein quantitation; immunologic detection and electrophoresis. Cross-listed as MBB 445. Credit is allowed for only MBB 445 or MIC 445. Prerequisites: both BIO 340 and MIC 302 or only instructor approval.

MIC 446 Techniques in Molecular Biology/Genetics Lab. (2)*fall and spring*

Molecular genetic techniques; plasmid construction, purification, and characterization; PCR; mutageneses; hybridization and sequence analysis; protein quantitation; immunologic detection and electrophoresis. Cross-listed as MBB 446. Credit is allowed for only MBB 446 or MIC 446. Pre- or corequisite: MBB 445 or MIC 445.

MIC 470 Bacterial Diversity and Systematics. (4)*fall*

Biology, classification, and enrichment culture of the nonpathogenic bacteria. 2 hours lecture, 6 hours lab. Fee. Prerequisite: MIC 302.

MIC 485 General Virology. (3)*fall*

Fundamental nature of viruses, their replication, pathogenesis, and ecology. Prerequisites: both BIO 340 and CHM 331 or only instructor approval.

MIC 486 General Virology Laboratory. (2)*not regularly offered*

Fundamentals of virus detection, isolation and assay; propagation of virus in mammalian cell culture; recombinant virus and vector construction. 6 hours lab. Prerequisite: MIC 302. Pre- or corequisite: MIC 485.

MIC 494 Special Topics. (1–4)*not regularly offered*

Possible topics:

(a) Clinical Bacteriology Laboratory. (3)

MIC 495 Undergraduate Research. (1–6)*fall, spring, summer*

Supervised research in microbiology. May be repeated for credit. Lab. Prerequisites: MIC 206, 220, 302; instructor approval.

MIC 527 Neuroimmunology. (3)*spring in odd years*

Studies mind's influence on immunity and the immune system's influence on the mind, neuroimmunologic diseases, and the neuroimmunological circuitry involved. Seminar. Prerequisite: MIC 420 or instructor approval.

MIC 581 Molecular Mechanism of Pathogenesis. (3)*not regularly offered*

Pathogenic mechanisms and host responses in viral and/or bacterial diseases. Prerequisites: both MIC 381 and 420 or only instructor approval.

MIC 585 Molecular Virology. (3)*not regularly offered*

Selected topics concerning molecular aspects of eukaryotic virus replication and pathogenesis. Prerequisite: instructor approval.

MIC 591 Seminar. (1–12)*fall and spring*

Possible topics:

(a) Bacterial Ecology. (1–3)

(b) Current Research in Microbiology. (1–3)

(c) Enzymology. (1–3)

(d) Genetic Engineering. (1–3)

(e) Genetics. (1–3)

(f) Immunology. (1–3)

(g) Molecular Virology. (1–3)

(h) Neuroimmunology. (1–3)

(i) Pathogenic Bacteriology. (1–3)

Department of Military Science

Army ROTC

Lt. Col. Scott Crawford
Chair
 (TCB 104) 480/965-3318
www.asu.edu/clas/military

PROFESSORS

CRAWFORD, DALGLEISH, WALLER

ASSISTANT PROFESSORS

FISCHER, ROLLINS, ROMESBURG, RUDOLPH

INSTRUCTOR

RINGENOLDUS

CLINICAL ASSOCIATE PROFESSOR

COX

PURPOSE

The Department of Military Science curriculum consists of the basic course (MIS 101, 102, 201, and 202) and the advanced course (MIS 301, 302, 401, and 402). The goal of this professional education curriculum is to prepare students with leadership potential to be commissioned as U.S. Army officers. Objectives include developing the following characteristics in students: leadership and managerial skills, the ability to think creatively, the ability to speak and write effectively, appreciation of the requirements for national security, and an understanding of the nature and functions of the U.S. Army. Upon successful completion of the advanced course and graduation, qualified students receive commissions in the Active Army (on a competitive basis), U.S. Army Reserve, or Army National Guard.

In addition to the military science curriculum, core courses in the field of national defense studies are both an integral and parallel source of the department's program. Integrally, they provide MIS courses at all levels with topical intensity and highlight such professionally related areas as military technology; weapons procurement; national intelligence, secrecy, and counterintelligence; civil-military relations; security coalitions and regional defense communities; national, regional, and global levels of strategy; generalship skill-in-action; deterrence dynamics and structure; military doctrine; service-branch livelihood, appropriations rivalry, and interservice cooperation; personnel recruitment, morale, training, advancement, and bureaucratic organization; military reform; threat and threat perception; military-historical experience and analogy; media and biographical insights; the rationale and matrices of security analysis and research; and independently selectable topics.

The department also fields an independent but parallel set of 400-level courses in the areas of geostrategic, politico-strategic, and national defense policy and analysis—available to students irrespective of Reserve Officers' Training Corps (ROTC) status, departmental major, or college affilia-

tion—for assigned credit toward General Studies, social science, and global awareness requirements for graduation. (See "Classification of Courses," page 51, for a description of course 499 Individualized Instruction.)

GENERAL QUALIFICATIONS

Basic Course. Any student who is enrolled in ASU (or approved by the professor of military science) can enter into military science basic classes. It is strongly recommended that the student be in good physical shape because some of the curriculum requires physical exertion.

Advanced Course. Any student who is enrolled in ASU (or approved by the professor of military science) may participate in military science advanced classes. However, to be fully enrolled in the advanced course and compete for and obtain a commission in the U.S. Army, students must meet the following requirements:

1. be a citizen of the United States (noncitizens may enroll but must obtain citizenship before commissioning);
2. be of sound physical condition and pass the U.S. Army physical fitness test;
3. meet the required professional military educational requirements; and
4. be at least 17 years of age for entrance into the advanced course and be able to complete all commissioning requirements before age 27.

Only those students in the basic and advanced courses who meet the required standards according to military regulations are eligible to receive financial assistance through the U.S. Army. Faculty of the Department of Military Science are available during normal office hours to answer questions or provide counseling.

The following are various options open to students who wish to obtain a commission in the U.S. Army. Contact the Department of Military Science personnel for more information.

Four-Year Program. Students may enroll in Army ROTC during their freshman year. They take the basic course during the first two years, receiving a total of 12 semester hours of credit for four semesters of study. Upon satisfying the requirements, they enter the advanced course, where they earn 12 additional semester hours for four semesters of study. Students are also required to attend a five-week advanced summer camp at Fort Lewis, Washington, between their junior and senior years. All commissioned officers must meet certain Professional Military Education requirements by completing courses in English, math, and computer literacy. Selected majors such as nursing, engineering, and architecture, among others, may require an additional semester or two, or summer school, to complete all requirements for a degree and commission without excessive course overloads. Upon successful completion of the advanced course and requirements for a degree, students are commissioned as second lieutenants in the Active Duty Army, U.S. Army Reserve, or Army National Guard.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Two-Year Program. Students must have at least two academic years of college work remaining, either at the undergraduate or graduate level. The student must also have reached academic junior status. This program is open to all students with the exception of three- and four-year Army ROTC scholarship winners (see “Scholarship Programs” on this page). Students seeking enrollment in the two-year program should make application during the spring semester of the calendar year in which they desire to enter the program. They must provide SAT/ACT scores and pass the Army physical fitness test. After successfully completing a paid five-week basic camp, students may enroll in the advanced course. (The camp is conducted during June and July at Fort Knox, Kentucky.) Students who have previous military experience or who are currently members of the National Guard or Reserves may be admitted directly into the two-year program, provided they are academic juniors. They then follow the same program and meet the same requirements as stated for advanced course students in the four-year program.

Qualifications for Admittance to the Advanced Course. The following qualifications are required for admittance to the advanced course:

1. successful completion of the basic course for the students in the four-year ROTC program; for the students in the two-year program, selection for and completion of the six-week basic summer camp or prior military service;
2. score at least 950 on SAT or 19 on ACT;
3. passing the Army physical examination;
4. achieving and maintaining the minimum cumulative GPA required for graduation in the student’s selected major, but no less than 2.00;
5. attainment of at least junior class standing; and
6. maintenance of full-time student status.

Pay and Allowances. Each advanced course student receives one-half the pay of a second lieutenant during attendance at the six-week advanced camp. Uniforms, housing, and meals are provided at camp without cost to the students, and they are reimbursed at the current mileage rate for travel to and from the camp. Students who attend basic camp receive the pay of an army recruit during attendance at basic camp as well as the current mileage rate for travel to and from the camp. All students in the advanced course, regardless of scholarship status, are paid about \$1,500 tax-free for each of these two years.

Simultaneous Membership Program. Under this program, ROTC students may simultaneously be members of the Army Reserves or the National Guard. The combination of advance course allowance and pay for Army Reserve or National Guard participation provides more than \$1,250 for each semester’s involvement.

Scholarship Programs. The Army ROTC offers scholarship programs for outstanding young men and women who are motivated toward a career as professional officers in the U.S. Army. These scholarships are awarded in varying amounts for tuition. In addition, the scholarship pays \$150.00 per month subsistence allowance and \$225.00 each semester for textbooks and supplies. A scholarship for four

years is available to freshmen who enter the four-year program. Applications must be submitted in accordance with a schedule furnished by high school counselors. Selection is made on a nationwide basis. Scholarships are also available for three- and two-year periods, commencing with the sophomore and junior years of ROTC respectively. Applications are open to all students in good standing with the university; previous ROTC or military experience is not required for application for three- and two-year scholarships. Selection is made by a review board on campus. Acceptance of any of the three scholarship programs requires a service commitment to serve in the Active Army for a period of up to four years after commissioning and graduation.

Active Duty Requirements. Graduates of Army ROTC may serve as officers in the Active Army, Army National Guard, or Army Reserves. Active duty commitments may vary from four years to as little as three months. Scholarship students have up to a four-year active duty commitment.

Graduate and Professional Studies Programs. A delay of up to four years in call to active duty is available to outstanding students who desire to earn graduate or professional degrees. Special programs for graduate and professional studies are available to both active Army appointees and Reserve component appointees in the following areas: medicine, osteopathy, and clinical psychology.

MILITARY SCIENCE (MIS)

MIS 101 Introduction to the Military. (3)

fall

Overview of mission, organization, and structure of the Army and its role in national defense; discussion of current military issues. 3 hours lecture/conference, 2 hours lab.

MIS 102 Land Navigation, First Aid, and Survival. (3)

spring

Introduction to military maps and land navigation; first aid, and lifesaving techniques; basic outdoor survival skills. 3 hours lecture/conference, 2 hours lab.

MIS 201 American Military History. (3)

fall

Studies the role of the military in American life during war and peace from colonial times to the present day. 3 hours lecture/conference, 2 hours lab.

MIS 202 Introduction to Leadership Dynamics. (3)

spring

Introduction to interpersonal dynamics involved in military team operations; theory and application of military leadership principles. 3 hours lecture/conference, 2 hours lab.

MIS 205 ROTC Basic Camp. (4)

summer

6-week training program emphasizing practical hands-on skills and leadership development. Taken in lieu of MIS 101, 102, 201, 202. Conducted at Fort Knox, Kentucky.

MIS 301 Advanced Military Science I. (3)

fall

Theory and dynamics of the individual soldier and military units in offensive combat operations. 2 hours lecture/conference, 1.5 hours of Leadership Practical Application, 1 2-day field exercise, 3 1-day field exercises. Prerequisites: MIS 101 and 102 and 201 and 202 (or their equivalents). Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

MIS 302 Advanced Military Science II. (3)

spring

Theory and dynamics of military units in defensive combat operations. 2 hours lecture/conference, 1.5 hours Leadership Practical Application, 1 3-day field exercise, 2 1-day field exercises. Prerequisites: MIS 101 and 102 and 201 and 202 (or their equivalents). Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

MIS 303 ROTC Advanced Camp. (4)*summer*

6-week training program emphasizing leadership development and advanced military skills, including tactics, land navigation, and physical training. Conducted at Fort Lewis, Washington. Prerequisites: MIS 301, 302.

MIS 401 Advanced Military Science III. (3)*fall*

Military legal system; preparation and conduct of military training; leadership development; ethics and professionalism of the military officer. 3 hours lecture/conference, 2 hours Leadership Practical Application, 1 2-day field exercise, 3 1-day field exercises. Prerequisites: MIS 301, 302. Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

MIS 402 Advanced Military Science IV. (3)*spring*

Military correspondence; career planning and personal affairs in service; conduct of training; leadership development; ethics and professionalism of the military officer. 3 hours lecture, 2 hours Leadership Practical Application, 1 3-day field exercise, 2 1-day field exercises. Prerequisites: MIS 301, 302. Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

MIS 410 American Defense Policy I. (3)*fall*

Evolution, organization, and execution of U.S. national security policy. *General Studies: SB*

MIS 412 American Defense Policy II. (3)*spring*

Contemporary problems and analytical issues in the formation and implementation of U.S. national security. Prerequisite: MIS 410. *General Studies: SB*

MIS 414 Comparative Defense Policy Analysis. (3)*fall*

Historical problems and analytical issues in the evolution, organization, application, and control of effective military establishments in various political systems. *General Studies: SB*

MIS 416 Soviet/C.I.S. Foreign and Defense Policies. (3)*spring*

Analysis of foreign and security policies of the Soviet Union/C.I.S. and of the successor states to the Warsaw Pact. *General Studies: SB*

MIS 499 Individualized Instruction: National Defense Analysis. (1-3)*not regularly offered*

Molecular and Cellular Biology

Bertram L. Jacobs*Director, Interdisciplinary Committee***(LSE 411) 480/965-0743****lsvl.la.asu.edu/mcb**

GRADUATE PROGRAMS

The interdisciplinary M.S. and Ph.D. degrees with a major in Molecular and Cellular Biology are administered by the Interdisciplinary Committee on Molecular and Cellular Biology. The participating faculty are drawn primarily from four core departments (the Departments of Biology, Chemistry and Biochemistry, Microbiology, and Plant Biology), with additional faculty from the Departments of Anthropology and Physics and Astronomy.

For more information, contact the director or see the *Graduate Catalog*.

MOLECULAR AND CELLULAR BIOLOGY (MCB)

See the *Graduate Catalog* for the MCB courses.

Molecular Biosciences and Biotechnology

J. Kenneth Hooper*Chair***Department of Plant Biology****(LSE 218) 480/965-3414****Edward A. Birge***Codirector***Department of Microbiology****(LSE 210) 480/965-1457****lifesciences.asu.edu/mbb**

MOLECULAR BIOSCIENCES AND BIOTECHNOLOGY—B.S.

The interdepartmental B.S. degree in Molecular Biosciences and Biotechnology is designed to prepare students for productive careers in rapidly expanding areas within the life sciences, such as biotechnology, medicine, and biomedical research or any area of biology at the molecular and cellular level. Courses and faculty are drawn primarily from the Departments of Plant Biology and Microbiology, with additional participation by the Departments of Biology and Chemistry and Biochemistry.

General Program

The B.S. degree program consists of approximately 55 semester hours of course work in required courses plus two courses in mathematics specifically designed for this program. The required major courses (22 total semester hours) are as follows:

MBB 245 Cellular and Molecular Biology <i>SQ</i>	3
MBB 246 Cellular and Molecular Biology Laboratory.....	1
MBB 343 Genetic Engineering and Society.....	4
MBB 484 Internship.....	6
or MBB 499 Individualized Instruction (6)	
MBB 490 Capstone: Issues in Biotechnology.....	4
MIC 206 Microbiology Laboratory <i>SG*</i>	1
MIC 220 Biology of Microorganisms.....	3
Total.....	22

* Both MIC 205 and 206 must be taken for SG credit.

Choose two or more of the following courses (or combinations) for a total of 8 to 16 semester hours:

BIO 340 General Genetics.....	4
BIO 353 Cell Biology.....	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

BIO 494 ST: Cell Biotechnology.....	4
MBB 350 Applied Genetics.....	4
MBB 445 Techniques in Molecular Biology/Genetics.....	2
MBB 446 Techniques in Molecular Biology/Genetics Lab ¹	2
MIC 420 Immunology: Molecular and Cellular Foundations.....	3
MIC 421 Experimental Immunology ²	2
Total	8–16

¹ MBB 446 is taken with 445.

² MIC 421 is taken with 420.

Required supplemental courses in biology, chemistry, and physics (25 total semester hours) are as follows:

BCH 361 Principles of Biochemistry.....	3
BCH 367 Elementary Biochemistry Laboratory.....	1
CHM 113 General Chemistry SQ.....	4
CHM 115 General Chemistry with Qualitative Analysis SQ.....	5
CHM 231 Elementary Organic Chemistry SQ ¹	3
CHM 235 Elementary Organic Chemistry Laboratory SQ ¹	1
PHY 111 General Physics SQ ²	3
PHY 112 General Physics SQ ³	3
PHY 113 General Physics Laboratory SQ ²	1
PHY 114 General Physics Laboratory SQ ³	1
Total	25

¹ Both CHM 231 and 235 must be taken to secure SQ credit.

² Both PHY 111 and 113 must be taken to secure SQ credit.

³ Both PHY 112 and 114 must be taken to secure SQ credit.



ASU staff member Christi Roger creates glassware for use in chemistry classes.

Tim Trumble photo

Courses that satisfy university mathematical studies requirements are as follows (six total semester hours):

MAT 251 Calculus for Life Sciences MA.....	3
MAT 351 Mathematical Methods for Genetic Analysis CS.....	3
Total	6

Additional courses are available in the life or physical sciences for elective credit.

MOLECULAR BIOSCIENCES/BIOTECHNOLOGY (MBB)

MBB 245 Cellular and Molecular Biology. (3)

fall and spring

Concepts that underlie relationships between cellular and subcellular structure and function, and integration of major metabolic and genetic processes. Prerequisite: Life Science major or preprofessional student in health-related sciences.

General Studies: SQ (if credit also earned in MBB 246)

MBB 246 Cellular and Molecular Biology Laboratory. (1)

fall and spring

Experiments that illustrate relationships between structure, function, and genetic processes at the cellular and molecular level. Laboratory. Prerequisite: MBB 245.

General Studies: SQ (if credit also earned in MBB 245)

MBB 343 Genetic Engineering and Society. (4)

fall

Introduction to genetic engineering, with emphasis on applications (gene therapy, DNA fingerprinting, bioremediation, transgenic animals and plants). 3 hours lecture, 3 hours lab. Cross-listed as BIO 343. Credit is allowed for only BIO 343 or MBB 343. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).

General Studies: L

MBB 350 Applied Genetics. (4)

spring

Introduction to molecular genetics with emphasis on application of genetics in solving biological questions and engineering organisms in biotechnology. 2 hours lecture, 6 hours lab. Cross-listed as PLB 350. Credit is allowed for only MBB 350 or PLB 350. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).

MBB 445 Techniques in Molecular Biology/Genetics. (2)

fall and spring

Molecular genetic principles: plasmid construction, purification, and characterization; PCR; mutagenesis; hybridization and sequence analysis; protein quantitation, immunologic detection, and electrophoresis. Cross-listed as MIC 445. Credit is allowed for only MBB 445 or MIC 445. Prerequisites: both BIO 340 and MIC 302 or only instructor approval.

MBB 446 Techniques in Molecular Biology/Genetics Lab. (2)

fall and spring

Molecular genetic techniques; plasmid construction, purification, and characterization; PCR; mutagenesis; hybridization and sequence analysis; protein quantitation; immunologic detection and electrophoresis. Cross-listed as MIC 446. Credit is allowed for only MBB 446 or MIC 446. Pre- or corequisite: MBB 445 or MIC 445.

MBB 484 Internship. (3)

not regularly offered

MBB 490 Capstone: Issues in Biotechnology. (2)

fall and spring

Integration of science and humanities within problem-solving exercises dealing with intellectual property, ethics, regulatory issues, business practices, and commercialization. Prerequisite: Molecular Biosciences/Biotechnology major or instructor approval.

MBB 499 Individualized Instruction. (3)

not regularly offered

Department of Philosophy

Brad Armentt
Chair
 (PS A524) 480/965-3394
www.asu.edu/clas/philosophy

REGENTS' PROFESSOR MURPHY

PROFESSORS
 COHEN, CREATH, FITCH, FRENCH, HUMPHREY,
 MAIENSCHIN, WHITE

ASSOCIATE PROFESSORS
 ARMENDT, BLACKSON, de MARNEFFE, GULESERIAN,
 KOBES, MCGREGOR, REYNOLDS

ASSISTANT PROFESSORS
 DEVLIN, MASON

LECTURER
 BOLTON

PHILOSOPHY—B.A.

The major in Philosophy consists of 45 semester hours, 33 of which must be upper-division hours. In addition to the 45 semester hours, the mathematics proficiency requirement must be met by completing MAT 117 or higher. In exceptional cases, up to nine semester hours may be in related fields as approved by the undergraduate advisor. Required courses are as follows:

PHI 300	Philosophical Argument and Exposition <i>L</i>	3
PHI 301	History of Ancient Philosophy <i>HU, H</i>	3
PHI 302	History of Modern Philosophy <i>HU, H</i>	3
PHI 305	Ethical Theory <i>HU</i>	3
	or PHI 335 History of Ethics <i>HU</i> (3)	
PHI 312	Theory of Knowledge <i>HU</i>	3
	or PHI 314 Philosophy of Science <i>HU</i> (3)	
PHI 316	Metaphysics <i>HU</i>	3
	or PHI 317 Philosophy of Mind <i>HU</i> (3)	
PHI 333	Introduction to Symbolic Logic	3
	Choose two courses below	6
PHI 401	Rationalism (3)	
PHI 402	Empiricism <i>HU</i> (3)	
PHI 403	Contemporary Analytic Philosophy <i>HU</i> (3)	
PHI 413	Advanced Symbolic Logic (3)	
PHI 420	Topics in Philosophy (3)	
PHI 494	Special Topics (3)	
Total	.....	27

Exceptions by special permission of the chair only. PHI 420 may be repeated for credit.

Students planning to do graduate work in philosophy should consult with an advisor to develop an appropriate selection of courses at the 300 and 400 levels. A minimum grade of "C" is necessary for each course used to fulfill the major requirements. See "College Degree Requirements," page 319.

History and Philosophy of Science. The faculty in the Department of Philosophy offer courses bearing the HPS prefix. With the consent of the director of undergraduate studies, these courses may be taken to satisfy the requirements of the Philosophy major.

MINOR IN PHILOSOPHY

A minor in Philosophy consists of 18 semester hours, of which at least 12 must be in the upper division and approved by an advisor in the department. All courses must be passed with a minimum grade of "C."

CERTIFICATE IN ETHICS

The Ethics Certificate consists of 18 semester hours approved by an advisor in the department. The student must take PHI 305 or 335. At least 15 hours must be chosen from PHI 105, 304, 305, 306, 307, 309, 310, 335, and (when its topic is within ethics) PHI 420. One course outside this list, and perhaps outside the department, may be used with written approval from the Director of Undergraduate Studies. All courses must be passed with a minimum grade of "C."

CERTIFICATE IN HISTORY AND PHILOSOPHY OF SCIENCE

The History and Philosophy of Science Certificate consists of 18 semester hours, of which at least 12 must be in the upper division and approved by an advisor in the department. At least nine semester hours must be HPS, and three semester hours must be PHI 314 Philosophy of Science. All courses must be passed with a minimum grade of "C."

GRADUATE PROGRAM

The faculty in the Department of Philosophy offer a graduate program leading to the M.A. and Ph.D. degrees. See the *Graduate Catalog* for requirements.

HISTORY AND PHILOSOPHY OF SCIENCE (HPS)

HPS 311 Origins, Evolution, and Creation. (3)

not regularly offered

Examines scientific, mythic, and religious ideas relating to origins (particularly human). Place of antievolutionism and "scientific creationism" in American culture. Lecture, discussion. Cross-listed as BIO 344/HUM 371/REL 383. Credit is allowed for only BIO 344 or HPS 311 or HUM 371 or REL 383.

HPS 322 History of Science. (3)

once a year

Development and application of scientific thinking from ancient times through the 17th century.

General Studies: HU, H

HPS 323 History of Science. (3)

not regularly offered

Development and application of scientific thinking from the 18th century to the present.

General Studies: HU, H

HPS 325 Chinese Science and Medicine. (3)

not regularly offered

Explores development of Chinese traditions dealing with the natural world, science, and medicine. Lecture, discussion. Cross-listed as HST 385. Credit is allowed for only HPS 325 or HST 385.

General Studies: HU, G, H

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

HPS 330 History of Biology: Conflicts and Controversies. (3)*not regularly offered*

Focuses on the 19th and 20th centuries, considering biology as a discipline. Evolution, problems of heredity, development, and cell theory. Cross-listed as BIO 316. Credit is allowed for only BIO 316 or HPS 330.

*General Studies: H***HPS 331 History of Medicine. (3)***once a year*

Scientific study of the human body, changing theories of disease, evolution of practical opinions on treatment, and the emerging institutionalization of medical practice. Cross-listed as BIO 318. Credit is allowed for only BIO 318 or HPS 331.

*General Studies: H***HPS 332 The Darwinian Revolution. (3)***not regularly offered*

Intellectual and cultural history of Darwinism and modern evolutionary theory and their impact on 19th- and 20th-century thought. Lecture, discussion. Cross-listed as BIO 346/HUM 372. Credit is allowed for only BIO 346 or HPS 332 or HUM 372.

HPS 402 Technology, Society, and Human Values. (3)*once a year*

Values that motivate humankind to create technology. Areas of conflict and resolution of conflict between values and technology. Readings and discussions with visiting lecturers. Prerequisite: junior standing.

HPS 410 Professional Values in Science. (3)*once a year*

Considers issues related to values in science such as collaboration, finances, legal issues, media, mentoring, ownership of ideas, scientific integrity. Discussion, student projects. Cross-listed as BIO 416. Credit is allowed for only BIO 416 or HPS 410.

*General Studies: L***PHILOSOPHY (PHI)****PHI 101 Introduction to Philosophy. (3)***fall, spring, summer*

Explores issues that philosophers have traditionally considered, including morality, reality, and knowledge.

*General Studies: HU***PHI 103 Principles of Sound Reasoning. (3)***fall, spring, summer*

Fallacies, validity, and soundness of arguments. May include syllogistic, elementary symbolic, inductive logic, and scientific method. Prerequisite: ENG 101 (or 105).

*General Studies: L/HU***PHI 105 Introduction to Ethics. (3)***once a year*

Philosophical examination of such questions as, How should we live? Is morality a social invention? Does anything matter?

*General Studies: HU***PHI 300 Philosophical Argument and Exposition. (3)***spring*

Develops techniques of philosophical argument and exposition. Frequent written exercises. Course content may vary with instructor. Prerequisites: major; instructor approval.

*General Studies: L***PHI 301 History of Ancient Philosophy. (3)***fall*

History of Western philosophy from its beginnings through the Hellenistic period.

*General Studies: HU, H***PHI 302 History of Modern Philosophy. (3)***spring*

History of Western philosophy from the Renaissance through Kant.

*General Studies: HU, H***PHI 304 Existentialism. (3)***not regularly offered*

Covers such topics as absurdity, authenticity, the meaning of life and death, responsibility, and subjectivity. May include readings in phenomenology.

*General Studies: HU***PHI 305 Ethical Theory. (3)***once a year*

Current theories about the nature of morality (metaethics) and about what is right and wrong (normative ethics). Prerequisite: PHI 105 or 306 or 307 or 309 or 335 or instructor approval.

*General Studies: HU***PHI 306 Applied Ethics. (3)***fall, spring, summer*

Philosophical discussion of contemporary moral and political issues, such as abortion, euthanasia, animal rights, affirmative action, and sexual rights.

*General Studies: HU***PHI 307 Philosophy of Law. (3)***once a year*

Nature and source of law and its relation to morality. Legal rights, legal enforcement of morals, civil disobedience, liability and responsibility, punishment, judicial reasoning, justice, property, and differences between theories of natural and positive law.

*General Studies: HU***PHI 308 Philosophy of Art. (3)***once a year*

Central problems in philosophy of art, e.g., the nature of a work of art, modern and traditional theories of art, aesthetic perception and experience, and objectivity and relativity in art criticism.

*General Studies: HU***PHI 309 Social and Political Philosophy. (3)***once a year*

Alternative principles and methods relevant to problems of human association and conflict; discusses justice and power, freedom and equality, and autonomy and order. Prerequisite: PHI 105 or 305 or 335 or instructor approval.

*General Studies: HU***PHI 310 Environmental Ethics. (3)***once a year*

Examines a full range of philosophical positions pertaining to our moral relationship to the natural world; anthropocentrism, individualism, biocentrism.

*General Studies: HU***PHI 311 Philosophy in Literature. (3)***once a year*

Selected works of literature introduce philosophical problems such as the nature of moral goodness and people's relation to the world and other people.

*General Studies: HU***PHI 312 Theory of Knowledge. (3)***once a year*

Nature, sources, and limits of human knowledge. Topics may include truth, a priori knowledge, empirical knowledge, perception, induction, and skepticism. Prerequisite: PHI 101 or 103 or 300 or 301 or 302 or 333.

*General Studies: HU***PHI 314 Philosophy of Science. (3)***once a year*

Structure and justification of scientific theories, explanation, and theory change. Roles of observation and laws, theoretical concepts and entities, reduction, probability, confirmation, space and time, and causation.

*General Studies: HU***PHI 315 Philosophy of Language. (3)***once a year*

Problems pertaining to the nature of language, including meaning, reference, truth, definition, analyticity, translatability, synonymy, and contributions of contemporary linguistics. Prerequisite: PHI 103 or 300 or 333.

*General Studies: HU***PHI 316 Metaphysics. (3)***once a year*

Problems pertaining to the nature of reality. Topics may include nature of person, minds, substance, universals, space, time, causation, and modality. Prerequisite: PHI 101 or 103 or 300 or 301 or 333.

General Studies: HU

PHI 317 Philosophy of Mind. (3)*once a year*

Nature of consciousness. Common sense view of mind, behaviorism, materialism, dualism, functionalism, self-knowledge, and knowledge of other minds. Prerequisite: PHI 101 or 103 or 300 or 301 or 302 or 333.

*General Studies: HU***PHI 318 Philosophy of Religion. (3)***once a year*

Classical arguments for the existence of God. Argument from evil against the existence of God. Justification of religious belief.

*General Studies: HU***PHI 319 Philosophy of Computing. (3)***not regularly offered*

Philosophical problems surrounding the theory of computation. Turing machines, mind and AI, neural network computing, ethics, and epistemology of computing. Lecture, lab, discussion.

*General Studies: CS/HU***PHI 325 Philosophy of Social Science. (3)***not regularly offered*

Philosophical problems surrounding the aims, structure, and methods of the social sciences.

*General Studies: HU/SB***PHI 332 19th-Century Philosophy. (3)***not regularly offered*

History of 19th-century philosophical thought, emphasizing either the German or the British traditions. Prerequisite: PHI 302.

*General Studies: HU***PHI 333 Introduction to Symbolic Logic. (3)***once a year*

Symbolic techniques, emphasizing deductions and proofs in the propositional and 1st-order predicate calculi.

PHI 335 History of Ethics. (3)*once a year*

Major works of moral philosophy, both ancient and modern, such as those by Plato, Aristotle, Hobbes, Hume, Kant, and Mill. Prerequisite: PHI 101 or 105 or 305 or 306 or 307 or 309 or instructor approval.

*General Studies: HU***PHI 401 Rationalism. (3)***not regularly offered*

Examines classical philosophical rationalism, as in Descartes, Spinoza, Malebranche, or Leibniz. Contemporary rationalist thought may also be examined. Prerequisites: PHI 302 and 305 (or 309 or 312 or 316 or 317).

PHI 402 Empiricism. (3)*not regularly offered*

Examines representatives of either classical or contemporary philosophical empiricism, e.g., Bacon, Hobbes, Locke, Butler, Berkeley, Reid, Hume, Mill, Carnap, and Ayer. Prerequisites: PHI 302 and 305 (or 309 or 312 or 316 or 317).

*General Studies: HU***PHI 403 Contemporary Analytic Philosophy. (3)***once a year*

Aims and methods of such 20th-century philosophers as Frege, Moore, Russell, Wittgenstein, Carnap, Ayer, Wisdom, Ryle, Austin, Strawson, Quine, and Sellars, with application to metaphysics and epistemology. Prerequisites: PHI 302 and 312 (or 314 or 315 or 316 or 317 or 401 or 402).

*General Studies: HU***PHI 413 Advanced Symbolic Logic. (3)***not regularly offered*

Properties of formal systems axiomatizing propositional and 1st-order predicate logic. May also include modal logic, number theory, and limits of logicism. Prerequisite: PHI 333.

PHI 420 Topics in Philosophy. (3)*once a year*

Course descriptions on file in department. May be repeated for credit.

Possible topics:

- (a) History of Philosophy
- (b) Metaphysics/Epistemology
- (c) Philosophy of Language/Logic
- (d) Philosophy of Science
- (e) Value Theory

Prerequisite: one relevant upper-division PHI course or instructor approval.

PHI 494 Special Topics. (3)*not regularly offered***PHI 590 Reading and Conference. (1–12)***not regularly offered***PHI 591 Seminar. (1–12)***once a year*

Possible topics:

- (a) Aesthetics. (1–3)
- (b) Epistemology. (1–3)
- (c) Ethics. (1–3)
- (d) History of Philosophy. (1–3)
- (e) Logic. (1–3)
- (f) Metaphysics. (1–3)
- (g) Philosophy of Language. (1–3)
- (h) Philosophy of Law. (1–3)
- (i) Philosophy of Science. (1–3)
- (j) Social and Political Philosophy. (1–3)

PHI 592 Research. (1–15)*not regularly offered***PHI 599 Thesis. (1–12)***fall and spring***PHI 790 Reading and Conference. (1–12)***not regularly offered***PHI 792 Research. (1–15)***not regularly offered***PHI 799 Dissertation. (1–15)***not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Department of Physics and Astronomy

Barry G. Ritchie
Chair
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REGENTS' PROFESSORS

SMITH, SPENCE

PROFESSORS

ALARCON, BAUER, BENNETT, BURSTEIN, CHAMBERLIN,
COMFORT, COWLEY, DOAK, DOW, HESTER, JACOB,
KAUFMANN, LINDSAY, MENENDEZ, PAGE, PONCE, REZ,
RITCHIE, SANKEY, SCHEINFEIN, SCHMIDT, STARRFIELD,
TILLERY, TSEN, TSONG, VENABLES,
WINDHORST, WYCKOFF

ASSOCIATE PROFESSORS

AANNESTAD, ACHARYA, BENIN, CULBERTSON,
DRUCKER, HERBOTS, MARZKE

ASSISTANT PROFESSOR

LEBED

PHYSICS—B.S.

Students majoring in Physics may pursue one of two options.

Option I. Designed for students who wish to pursue physics at the bachelor or graduate degree levels, option I consists of the following required courses:

Choose between the course combinations below.....	4
PHY 150 Physics I <i>SQ</i> (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹ (3)	
PHY 122 University Physics Laboratory I <i>SQ</i> ¹ (1)	
Choose between the course combinations below.....	4
PHY 151 Physics II <i>SQ</i> (4)	
_____ or _____	
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ² (3)	
PHY 132 University Physics Laboratory II <i>SQ</i> ² (1)	
PHY 201 Mathematical Methods in Physics I.....	3
PHY 252 Physics III <i>SQ</i>	4
PHY 302 Mathematical Methods in Physics II.....	2
PHY 310 Classical Particles, Fields, and Matter I.....	3
PHY 311 Classical Particles, Fields, and Matter II	3
PHY 314 Quantum Physics I.....	3
PHY 315 Quantum Physics II.....	3
PHY 333 Electronic Circuits and Measurements	3
PHY 334 Advanced Laboratory I	2
PHY 412 Classical Particles, Fields, and Matter III	3
PHY 416 Quantum Physics III	3
PHY 441 Statistical and Thermal Physics I.....	3
PHY 465 Advanced Laboratory II.....	2
Total	45

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

Supporting mathematics courses are as follows:

Choose between the course combinations below..... 12 or 10
 MAT 270 Calculus with Analytic Geometry I *MA* (4)
 MAT 271 Calculus with Analytic Geometry II *MA* (4)
 MAT 272 Calculus with Analytic Geometry III *MA* (4)

_____ or _____

MAT 290 Calculus I *MA* (5)
 MAT 291 Calculus II (5)

Additional courses in physics and related fields are selected with the approval of the advisor. French, German, or Russian is strongly recommended to fulfill the foreign language requirement.

Option II. The interdisciplinary option II is designed for students who wish to obtain an undergraduate physics preparation for entry into other professions or graduate programs. A total of 53 hours are required, including the following courses:

Choose between the course combinations below.....	4
PHY 150 Physics I <i>SQ</i> (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics <i>SQ</i> ¹ (3)	
PHY 122 University Physics Laboratory I <i>SQ</i> ¹ (1)	
Choose between the course combinations below.....	4
PHY 151 Physics II <i>SQ</i> (4)	
_____ or _____	
PHY 131 University Physics II: Electricity and Magnetism <i>SQ</i> ² (3)	
PHY 132 University Physics Laboratory II <i>SQ</i> ² (1)	
PHY 201 Mathematical Methods in Physics I.....	3
PHY 252 Physics III <i>SQ</i>	4
PHY 302 Mathematical Methods in Physics II.....	2
PHY 310 Classical Particles, Fields, and Matter I.....	3
PHY 311 Classical Particles, Fields, and Matter II	3
PHY 314 Quantum Physics I.....	3
PHY 315 Quantum Physics II.....	3
PHY 333 Electronic Circuits and Measurements	3
PHY 334 Advanced Laboratory I	2
PHY 412 Classical Particles, Fields, and Matter III	3
PHY 441 Statistical and Thermal Physics I.....	3
Total	40

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

The remaining courses are selected from physics and an area of concentration as approved by the student's advisor. Possible areas of concentration are astronomy, astrophysics, materials science, physical chemistry, applied mathematics, geophysics, biological physics, philosophy of science, scientific journalism, and premedical and prelaw programs. French, German, or Russian is strongly recommended to fulfill the foreign language requirement.

Supporting mathematics courses are as follows:

Choose between the course combinations below..... 12 or 10
 MAT 270 Calculus with Analytic Geometry I *MA* (4)
 MAT 271 Calculus with Analytic Geometry II *MA* (4)
 MAT 272 Calculus with Analytic Geometry III *MA* (4)

_____ or _____

MAT 290 Calculus I *MA* (5)
 MAT 291 Calculus II (5)

Emphasis in Astronomy

The astronomy faculty offer courses in astronomy both for nonscience majors and for science and physics majors.

For an emphasis in astronomy, the following courses (or their equivalents) should be taken:

AST 321 Introduction to Planetary and Stellar Astrophysics SQ^1	3
AST 322 Introduction to Galactic and Extragalactic Astrophysics SQ^2	3
AST 421 Astrophysics I	3
AST 422 Astrophysics II	3
AST 499 Individualized Instruction	3
Total	15

¹ Both AST 113 and 321 must be taken to secure SQ credit.

² Both AST 114 and 322 must be taken to secure SQ credit.

MINOR IN ASTRONOMY

The minor in Astronomy consists of a minimum of 24 semester hours. Required courses are as follows:

AST 113 Astronomy Laboratory I SQ^1	1
AST 114 Astronomy Laboratory II SQ^2	1
AST 321 Introduction to Planetary and Stellar Astrophysics SQ^1	3
AST 322 Introduction to Galactic and Extragalactic Astrophysics SQ^2	3
Choose between the course combinations below	4
PHY 150 Physics I SQ (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics SQ^3 (3)	
PHY 122 University Physics Laboratory I SQ^3 (1)	
Choose between the course combinations below	4
PHY 151 Physics II SQ (4)	
_____ or _____	
PHY 131 University Physics II: Electricity and Magnetism SQ^4 (3)	
PHY 132 University Physics Laboratory II SQ^4 (1)	
PHY 252 Physics III SQ	4
Approved upper-division electives	4
Total	24

¹ Both AST 113 and 321 must be taken to secure SQ credit.

² Both AST 114 and 322 must be taken to secure SQ credit.

³ Both PHY 121 and 122 must be taken to secure SQ credit.

⁴ Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen with the approval of an astronomy advisor from upper-division courses in physics and astronomy.

MINOR IN PHYSICS

The minor in Physics consists of a minimum of 29 semester hours. Required courses are as follows:

Choose between the course combinations below	4
PHY 150 Physics I SQ (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics SQ^1 (3)	
PHY 122 University Physics Laboratory I SQ^1 (1)	
Choose between the course combinations below	4
PHY 151 Physics II SQ (4)	
_____ or _____	

PHY 131 University Physics II: Electricity and Magnetism SQ^2 (3)	
PHY 132 University Physics Laboratory II SQ^2 (1)	
PHY 201 Mathematical Methods in Physics I	3
PHY 252 Physics III SQ	4
PHY 302 Mathematical Methods in Physics II	2
PHY 310 Classical Particles, Fields, and Matter I	3
PHY 311 Classical Particles, Fields, and Matter II	3
PHY 314 Quantum Physics I	3
Approved electives	3
Total	29

¹ Both PHY 121 and 122 must be taken to secure SQ credit.

² Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen with the approval of the physics advisor from upper-division courses in physics and astronomy.

SECONDARY EDUCATION—B.A.E.

Physics. Two options are available for physics as the major teaching field.

Option One. The major teaching field consists of 42 semester hours. Required courses are as follows:

Choose between the course combinations below	4
PHY 150 Physics I SQ^1 (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics SQ^2 (3)	
PHY 122 University Physics Laboratory I SQ^2 (1)	
Choose between the course combinations below	4
PHY 151 Physics II SQ^1 (4)	
_____ or _____	
PHY 131 University Physics II: Electricity and Magnetism SQ^3 (3)	
PHY 132 University Physics Laboratory II SQ^3 (1)	
PHY 201 Mathematical Methods in Physics I	3
PHY 252 Physics III SQ^1	4
PHY 302 Mathematical Methods in Physics II	2
PHY 310 Classical Particles, Fields, and Matter I	3
PHY 311 Classical Particles, Fields, and Matter II	3
PHY 333 Electronic Circuits and Measurements	3
PHY 361 Introductory Modern Physics	3
or PHY 314 Quantum Physics I (3)	
PHY 480 Methods of Teaching Physics	3
or PHY 484 Internship: Physics Teaching (1–4)	
Approved electives	10
Total	42

¹ PHY 111, 112, 113, and 114 or equivalents may be substituted for PHY 150, 151, and 252 with approval of the advisor.

² Both PHY 121 and 122 must be taken to secure SQ credit.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen in physics or other closely related fields, subject to the approval of the advisor.

Option Two. Option two consists of 32 semester hours in physics and an additional 30 semester hours in chemistry (see “Minor in Chemistry,” page 347) or mathematics (see “Minor in Mathematics,” page 404). The physics portion of this program requires the following courses:

Choose between the course combinations below.....	4
PHY 150 Physics I SQ^1 (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics SQ^2 (3)	
PHY 122 University Physics Laboratory I SQ^2 (1)	
Choose between the course combinations below.....	4
PHY 151 Physics II SQ^1 (4)	
_____ or _____	
PHY 131 University Physics II: Electricity and Magnetism SQ^3 (3)	
PHY 132 University Physics Laboratory II SQ^3 (1)	
PHY 201 Mathematical Methods in Physics I ⁴	3
PHY 252 Physics III SQ^1	4
PHY 302 Mathematical Methods in Physics II.....	2
PHY 310 Classical Particles, Fields, and Matter I.....	3
PHY 311 Classical Particles, Fields, and Matter II.....	3
PHY 333 Electronic Circuits and Measurements.....	3
PHY 361 Introductory Modern Physics.....	3
or PHY 314 Quantum Physics I (3)	
PHY 480 Methods of Teaching Physics ⁵	3
or PHY 484 Internship: Physics Teaching (1–4)	
Total	32

¹ PHY 111, 112, 113, and 114 or equivalents may be substituted for PHY 150, 151, and 252 with approval of the advisor.

² Both PHY 121 and 122 must be taken to secure SQ credit.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

⁴ Physics/Math option: MAT 274 plus MAT 342 may be substituted for PHY 201.

⁵ Physics/Chemistry option: CHM 480 may be substituted for PHY 480.

Minor Teaching Field. The minor teaching field consists of 24 semester hours. Required courses are as follows:

Choose between the course combinations below.....	4
PHY 150 Physics I SQ^1 (4)	
_____ or _____	
PHY 121 University Physics I: Mechanics SQ^2 (3)	
PHY 122 University Physics Laboratory I SQ^2 (1)	
Choose between the course combinations below.....	4
PHY 151 Physics II SQ^1 (4)	
_____ or _____	
PHY 131 University Physics II: Electricity and Magnetism SQ^3 (3)	
PHY 132 University Physics Laboratory II SQ^3 (1)	
PHY 201 Mathematical Methods in Physics I.....	3
PHY 252 Physics III SQ^1	4
PHY 314 Quantum Physics I.....	3
or PHY 361 Introductory Modern Physics (3)	
PHY 480 Methods of Teaching Physics.....	3
or PHY 484 Internship: Physics Teaching (1–4)	
Approved elective	3
Total	24

¹ PHY 111, 112, 113, and 114 may be substituted for PHY 150, 151, and 252, or equivalents, with approval of the advisor.

² Both PHY 121 and 122 must be taken to secure SQ credit.

³ Both PHY 131 and 132 must be taken to secure SQ credit.

The remaining hours are selected from upper-division courses in physics or astronomy (including AST 113 and 114), subject to approval of the advisor.

GRADUATE PROGRAMS

The faculty in the Department of Physics and Astronomy offer programs leading to the degrees of Master of Natural

Science, M.S., and Ph.D. See the *Graduate Catalog* for requirements.

ASTRONOMY (AST)

AST 111 Introduction to Solar Systems Astronomy. (3)

fall

History, properties of light, instruments, study of solar system and nearby stars. For nonscience majors. Optional lab (AST 113).

General Studies: SQ (if credit also earned in AST 113)

AST 112 Introduction to Stars, Galaxies, and Cosmology. (3)

spring

Structure and evolution of stars, star clusters, galaxies, cosmology. For nonscience majors. Optional lab (AST 114).

General Studies: SQ (if credit also earned in AST 114)

AST 113 Astronomy Laboratory I. (1)

fall

Astronomical observations and experiments designed to help the student become familiar with the sky, telescopes, and astronomical measurements. 2.5 hours lab. Pre- or corequisites: AST 111 (or 321); a working knowledge of high school algebra and geometry.

General Studies: SQ (if credit also earned in AST 111 or 321)

AST 114 Astronomy Laboratory II. (1)

spring

Similar to AST 113, but material chosen to supplement AST 112 and 322. 2.5 hours lab. Pre- or corequisites: AST 112 (or 322); a working knowledge of high school algebra and geometry.

General Studies: SQ (if credit also earned in AST 112 or 322)

AST 321 Introduction to Planetary and Stellar Astrophysics. (3)

fall

Physical laws; celestial mechanics; properties of planets, the sun, and other stars; formation and evolution of stars and planetary systems. Prerequisites: MAT 270 (or 290); PHY 150.

General Studies: SQ (if credit also earned in AST 113)

AST 322 Introduction to Galactic and Extragalactic Astrophysics. (3)

spring

Evolved stars, introduction to relativity, galaxies and interstellar matter, structure and dynamics of galaxies, cosmology. Prerequisite: AST 321 or instructor approval.

General Studies: SQ (if credit also earned in AST 114)

AST 421 Astrophysics I. (3)

fall

Selected astrophysical topics, including: stellar evolution, star formation, interstellar medium, galactic structure, extragalactic astronomy, high-energy astrophysics, and cosmology. Prerequisites: AST 321, 322; PHY 311, 314.

AST 422 Astrophysics II. (3)

spring

Same range of astrophysical topics as for AST 421 but different specific topics are emphasized in a given year. Prerequisites: AST 321, 322; PHY 311, 314.

AST 499 Individualized Instruction. (3)

not regularly offered

AST 598 Special Topics. (1–4)

not regularly offered

Possible topics:

- Astronomical Data Taking and Data Reduction
- Cosmology and High-Energy Astrophysics
- Extragalactic Astronomy
- Galactic Structure
- Interstellar Medium and Gaseous Astrophysics
- Stellar Interiors and Stellar Evolution

PHYSICAL SCIENCES (PHS)

PHS 110 Fundamentals of Physical Science. (4)

fall and spring

One-semester survey of the principles of physics and chemistry. Presumes understanding of elementary algebra. 3 hours lecture, 2 hours lab.

General Studies: SQ

PHS 208 Patterns in Nature. (4)*fall and spring*

Project-oriented science course with computer training to develop critical thinking and technical skills for student-oriented science lessons K–12. Lecture, lab. Cross-listed as STE 208. Credit is allowed for only PHS 208 or STE 208. Prerequisite: college-level science course or instructor approval.

*General Studies: SQ***PHS 484 Physical Science Internship. (3)***fall and spring*

Applies scientific concepts discussed and demonstrated in PHS 208 to teach middle school students. Hands-on experience is the focus of the teaching.

PHS 505 Energy and the Environment. (3)*summer*

Current problems in energy resources, production, consumption, and conservation. Studio. Prerequisite: instructor approval.

PHS 510 Inquiry Physical Science I. (3)*summer*

Inquiry approach to physical science, standards-based, intended for elementary school teachers. Topics selected: kinematics, dynamics, electricity, magnetism, light, astronomy. Studio. Prerequisite: instructor approval.

PHS 520 Inquiry Physical Science II. (3)*summer*

Inquiry approach to physics and astronomy, standards-based, intended for middle school teachers. Emphasizes technology and modeling. Studio. Prerequisite: instructor approval.

PHS 530 Methods of Physics Teaching I. (3)*summer*

Inquiry approach to high school physics teaching. Studio. Prerequisite: instructor approval.

PHS 531 Methods of Physics Teaching II. (3)*summer*

Extension of modeling techniques introduced in PHY 580. Studio. Prerequisite: PHS 530 or instructor approval.

PHS 534 Methods of Teaching Physical Science I, II, III. (3)*summer*

Design of curriculum and conduct of instruction for physical science courses. Studio. Prerequisite: instructor approval.

PHS 540 Integrated Physics and Chemistry. (3)*summer*

Collaborative inquiry methods for teaching and coordinating physics and chemistry. Studio. Prerequisite: CHM 480 or PHS 530 or PHY 480 or instructor approval.

PHS 542 Integrated Mathematics and Physics. (3)*summer*

Mathematical models and modeling as an integrating theme for secondary mathematics and physics. Studio. Prerequisite: instructor approval.

PHS 550 Physics and Astronomy. (3)*summer*

Astronomy curricula and projects for secondary school, with emphasis on the role of physics in astronomy. Studio. Prerequisite: instructor approval.

PHS 556 Astrophysics. (3)*summer*

Structure and evolution of stars, galaxies, and the universe. For secondary school teachers. Studio. Prerequisite: instructor approval.

PHS 560 Matter and Light. (3)*summer*

Interactions of light with matter. Lasers and spectroscopy. Studio. Prerequisite: instructor approval.

PHS 564 Light and Electron Optics. (3)*summer*

Principles and practice of electron-optical instruments. Studio. Prerequisite: instructor approval.

PHS 570 Spacetime Physics. (3)*summer*

Special and general theories of relativity with implications for space and time travel. Studio. Prerequisite: instructor approval.

PHS 581 Structure of Matter and Its Properties. (3)*summer*

Models of matter and its properties. Studio. Prerequisite: instructor approval.

PHYSICS (PHY)**PHY 101 Introduction to Physics. (4)***fall and spring*

Emphasizes applications of physics to life in the modern world. Presumes understanding of elementary algebra. 3 hours lecture, 1 recitation, 2 hours lab.

*General Studies: SQ***PHY 105 Basic Physics. (3)***fall*

One-semester survey of the principles of physics. Primarily for students who intend to take PHY 121, 131 but have not taken high school physics. 3 hours lecture, 1 recitation. Prerequisites: algebra and trigonometry.

PHY 111 General Physics. (3)*fall, spring, summer*

Noncalculus treatment of the principles of physics for nonphysics majors. Students whose curricula require a laboratory course must also register for PHY 113. 3 hours lecture, 1 recitation. Prerequisite: trigonometry.

*General Studies: SQ (if credit also earned in PHY 113)***PHY 112 General Physics. (3)***fall, spring, summer*

Continuation of PHY 111. Students whose curricula require a laboratory course must also register for PHY 114. Prerequisite: PHY 111.

*General Studies: SQ (if credit also earned in PHY 114)***PHY 113 General Physics Laboratory. (1)***fall, spring, summer*

Elementary experiments in physics. 2 hours lab. Requires outside preparation for experiments and report writing. May be taken concurrently with, or subsequent to, PHY 111.

*General Studies: SQ (if credit also earned in PHY 111)***PHY 114 General Physics Laboratory. (1)***fall, spring, summer*

See PHY 113. May be taken concurrently with, or subsequent to, PHY 112.

*General Studies: SQ (if credit also earned in PHY 112)***PHY 121 University Physics I: Mechanics. (3)***fall, spring, summer*

Kinematics; Newton's laws; work, energy, momentum, conservation laws; dynamics of particles, solids, and fluids. 3 hours lecture, 1 hour recitation. Prerequisite: MAT 270 or 290 or instructor approval.

*General Studies: SQ (if credit also earned in PHY 122)***PHY 122 University Physics Laboratory I. (1)***fall, spring, summer*

Lab accompanying PHY 121. Pre- or corequisite: PHY 121.

*General Studies: SQ (if credit also earned in PHY 121)***PHY 131 University Physics II: Electricity and Magnetism. (3)***fall, spring, summer*

Electric charge and current, electric and magnetic fields in vacuum and in materials, and induction. AC circuits, displacement current, and electromagnetic waves. 3 hours lecture, 1 hour recitation. Prerequisites: MAT 271 (or 291 or instructor approval); PHY 121. Corequisite: MAT 272 or instructor approval.

*General Studies: SQ (if credit also earned in PHY 132)***PHY 132 University Physics Laboratory II. (1)***spring and summer*

Lab accompanying PHY 131. Pre- or corequisite: PHY 131.

*General Studies: SQ (if credit also earned in PHY 131)***PHY 150 Physics I. (4)***spring*

Introductory physics for majors. Kinematics, Newton's Laws, basic forces, energy, momentum, special relativity. 3 hours lecture, 3 hours lab. Prerequisite: MAT 270 or 290 (or its equivalent).

General Studies: SQ

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

PHY 151 Physics II. (4)*fall*

Continuation of PHY 150. Electromagnetic fields; Ampere's and Faraday's Laws; Maxwell's equations; basic circuit elements. 3 hours lecture, 3 hours lab. Prerequisites: MAT 271 (or 291 or its equivalent); PHY 121, 122 (or 150).

General Studies: SQ

PHY 190 Seminar: Physics as a Curriculum and a Profession. (1)*fall and spring*

Seminar for new Physics majors. Instruction and information on curriculum, departmental functions, and professional preparation. Weekly meetings and excursions. Pass/fail grading.

PHY 201 Mathematical Methods in Physics I. (3)*spring*

Differential equations, linear equations, vectors, matrices, Fourier series, and numerical methods. 2 hours lecture, 2 hours lab. Prerequisite: MAT 272 (or its equivalent). Corequisite: PHY 252.

PHY 241 University Physics III. (3)*fall and spring*

Thermodynamics, kinetic theory, physical and wave optics, relativity, photons, matter waves, atomic physics. 3 hours lecture, 1 hour recitation. Prerequisites: PHY 131; nonmajor.

PHY 252 Physics III. (4)*spring*

Continuation of PHY 151. Wave physics, oscillations, harmonic systems, physical optics, thermodynamics, kinetic theory. 3 hours lecture, 3 hours lab. Prerequisites: MAT 272 (or its equivalent); PHY 131 and 132 (or 151 or its equivalent). Corequisite: PHY 201.

General Studies: SQ

PHY 302 Mathematical Methods in Physics II. (2)*fall*

Continuation of PHY 201. Vector calculus, complex variables, partial differential equations, special functions, numerical methods. 1 hour lecture, 3 hours lab. Prerequisite: PHY 201 (or its equivalent).

PHY 310 Classical Particles, Fields, and Matter I. (3)*fall*

Particle kinematics, mechanics, conservation laws, particle motion in force fields, dynamics of two-body systems, reference frames, rigid body motion, relativity. Corequisites: both PHY 302 and 314 or only instructor approval.

PHY 311 Classical Particles, Fields, and Matter II. (3)*spring*

Electrostatic and gravitational fields, Poisson and Laplace equations, dielectric materials, magnetic fields and materials, magnetic induction, Faraday's Law. Prerequisites: PHY 302, 310. Corequisite: PHY 315 or instructor approval.

PHY 314 Quantum Physics I. (3)*fall*

Photons, models of the atom, wave properties of matter, introduction to wave mechanics, 1-dimensional systems in quantum mechanics. Prerequisites: PHY 201 and 252 (or their equivalents). Corequisites: both PHY 302 and 310 or only instructor approval.

PHY 315 Quantum Physics II. (3)*spring*

General principles of quantum mechanics, 3-dimensional problems, approximation methods, spin, introduction to many-particle systems. Prerequisites: PHY 302, 310, 314. Corequisite: PHY 311 or instructor approval.

PHY 333 Electronic Circuits and Measurements. (3)*fall and spring*

Basic principles of electronic circuit analysis and measurement techniques using modern instrumentation and computer-aided analysis of data. 1 hour lecture, 3 hours lab; required equivalent effort outside of lab. Corequisite: PHY 201 or instructor approval.

PHY 334 Advanced Laboratory I. (2)*spring*

Selected experiments from contemporary physics. Emphasis on modern instrumentation, computer-assisted acquisition and analysis of data, and report form writing. Lecture, lab. Prerequisites: PHY 310, 314, 333.

PHY 361 Introductory Modern Physics. (3)*fall and spring*

Special relativity and introductory quantum theory with applications drawn from atomic, nuclear, and solid-state physics. 3 hours lecture, 1 recitation. Prerequisite: PHY 131.

PHY 412 Classical Particles, Fields, and Matter III. (3)*fall*

Electromagnetic fields of moving charges, Maxwell's equations, harmonic phenomena, oscillations, waves, electromagnetic radiation, covariant electromagnetism, introduction to general relativity. Prerequisites: PHY 311, 333. Corequisite: PHY 416 or instructor approval.

PHY 416 Quantum Physics III. (3)*fall*

Introduction to the quantum theory of atoms, molecules, solids and nuclei, Dirac's equation. Prerequisites: PHY 311, 315. Corequisite: PHY 412 or instructor approval.

PHY 420 Research Paper. (1)*fall and spring*

Scientific report writing. Culminates in a paper based on library or laboratory research or both. Taken in conjunction with other courses as approved. Conference. Prerequisite: instructor approval.

General Studies: L

PHY 441 Statistical and Thermal Physics I. (3)*fall*

Statistical and experimental basis of heat, temperature, and entropy. Mechanical and statistical basis of the laws of thermodynamics. Applications of macroscopic thermodynamics. Phase equilibrium. Prerequisites: PHY 311, 315.

PHY 442 Statistical and Thermal Physics II. (3)*spring*

Principles and applications of statistical mechanics. Quantum statistics of ideal gases and simple solids. Equilibrium of phases and chemical species. Transport theory. Irreversible processes and fluctuation. Prerequisite: PHY 441.

PHY 452 Physical Optics. (3)*fall*

Principles of reflection, refraction, diffraction. Additional topics from contemporary optics may include Fourier transform spectroscopy, linear systems theory, holography. 2 hours lecture, 2 hours lab. Prerequisites: PHY 302, 311, 315. Corequisite: PHY 412.

PHY 462 Nuclear and Particle Physics. (3)*spring*

Static properties of nuclei, natural and induced radioactivity, nuclear reactions, nuclear models and energy levels, mesons and hyperons, and interaction of photons and electrons with matter. Prerequisites: PHY 311, 315.

PHY 465 Advanced Laboratory II. (2)*fall and spring*

Continuation of PHY 334. Students are encouraged to substitute laboratory research project in consultation with faculty sponsor. Prerequisite: PHY 334.

PHY 466 Advanced Laboratory III. (1-3)*fall and spring*

Continuation of PHY 465. Prerequisite: PHY 465.

PHY 480 Methods of Teaching Physics. (3)*spring*

Evaluation of various approaches to the teaching of high school physics. Preparation of demonstrations and experiments. Organization of a laboratory. Designed for secondary school physics teachers. Prerequisite: instructor approval.

PHY 481 Solid-State Physics. (3)*spring*

Structure, elastic properties, and dynamics of crystals; electron motions in crystals under applied fields. Prerequisites: PHY 311, 315.

PHY 484 Internship: Physics Teaching. (1-4)*fall, spring, summer*

Preparation for high school physics teaching. Student works closely with a faculty member in the elementary physics program. May be repeated for a total of 6 semester hours. Prerequisite: instructor approval.

PHY 495 Project Research. (1-3)*fall and spring*

Supervised project in physics or astrophysics. May be repeated for credit. Prerequisite: instructor approval.

PHY 498 Pro-Seminar. (1-7)

not regularly offered

PHY 501 Methods of Theoretical Physics. (3)*fall and spring*

Provides mathematical foundations for graduate students in basic and applied physics. Complex variables, vector spaces, operators, matrices, ordinary differential equations, integral equations and transforms, and special functions. May include additional topics.

PHY 502 Methods of Theoretical Physics. (3)*fall and spring*

Continuation of PHY 501. Prerequisite: PHY 501.

PHY 521 Classical Mechanics. (3)*fall*

Variational principles, Lagrange's and Hamilton's equations, rigid body motion, canonical transformations, Hamilton-Jacobi theory.

PHY 523 Relativity. (3)*not regularly offered*

Special and general theories of relativity. Prerequisite: PHY 532 or instructor approval.

PHY 531 Advanced Electricity and Magnetism. (3)*fall*

Electrostatics and magnetostatics; potential theory and theory of constitutive relations; Maxwell's equations; the wave equation, plane electromagnetic waves, cavities, and wave guides.

PHY 532 Electrodynamics. (3)*spring*

Special theory of relativity, covariant formulation of electromagnetic interactions; inhomogeneous wave equations, Lienard-Wiechert potentials, and radiation fields; interactions of charged particles and electromagnetic waves, scattering, dispersion. Prerequisites: both PHY 412 and 531 or only instructor approval.

PHY 541 Statistical Physics. (3)*fall*

Probability theory and principles of statistical inference; evaluating experimental data; foundations of statistical mechanics; general laws of thermodynamics from microscopic theories; calculation of specific properties of bulk matter.

PHY 551 X-ray and Electron Diffraction. (3)*spring*

Fresnel and Fraunhofer diffraction in integral formulation; diffraction of X-rays and neutrons by crystal lattices; structures of solids, including crystal structure analysis; theory and techniques of electron microscopy/diffraction of crystalline/noncrystalline specimens. Prerequisite: PHY 481 or instructor approval.

PHY 561 Nuclear Physics. (3)*fall and spring*

Two-nucleon interaction, Clebsch-Gordon coefficients, internucleon forces, meson theory and high-energy scattering, nuclear binding energy, nuclear models, transition probability estimates, nuclear reactions, and beta decay. Prerequisite: PHY 576 or instructor approval.

PHY 562 Nuclear Physics. (3)*fall and spring*

Continuation of PHY 561. Prerequisite: PHY 561 or instructor approval.

PHY 568 Elementary Particle Physics. (3)*not regularly offered*

Classification of particles; phenomenology of strong, electromagnetic, and weak interactions, cross sections, and decay rates; isotopic spin and higher symmetries; structure of reaction amplitudes. Prerequisite: PHY 577.

PHY 569 Elementary Particle Theory. (3)*not regularly offered*

Continuation of PHY 568. Prerequisite: PHY 568.

PHY 571 Quantum Physics. (3)*spring*

Reviews modern physics, chemistry, math. Differential equation, operator, matrix formulations. Free particle, bound-state problems. Examples across physics and astronomy. Prerequisites: a combination of modern physics and linear and complex algebra and differential equations or only instructor approval.

PHY 576 Quantum Theory. (3)*fall and spring*

Abstract approach to quantum mechanics in Hilbert space; observables and their corresponding operators, eigenstates, and eigenvalues; quantum dynamics; approximation methods; systems of identical particles; angular momentum and group representation theory; collision processes; relativistic quantum theory. Prerequisite: PHY 521.

PHY 577 Quantum Theory. (3)*fall and spring*

Continuation of PHY 576. Prerequisite: PHY 576.

PHY 578 Relativistic Quantum Theory. (3)*fall and spring*

Relativistic 1-particle equations, Klein-Gordon equation, Dirac equation, 2D quantization, theory of scattering, S-matrix, Feynman diagrams, quantum electrodynamics, and renormalization procedures. Prerequisite: PHY 577.

PHY 579 Relativistic Quantum Theory. (3)*fall and spring*

Continuation of PHY 578. Prerequisite: PHY 578.

PHY 580 Practicum. (1–12)*not regularly offered***PHY 581 Solid-State Physics. (3)***fall*

Quantum theory of solids, including phonons, lattice-specific heats, band-structure models, Fermi surfaces, thermal expansion, plasmons, electron-phonon interactions, and scattering by lattice defects. Pre- or corequisite: PHY 576.

PHY 582 Solid-State Physics. (3)*spring*

Elements of transport theory, thermal conduction, electronic conduction in metals, mobility in semiconductors, Hall effect, magnetoresistance, and selected topics of current research. Prerequisite: PHY 581.

PHY 587 Quantum Optics. (3)*fall and spring*

Quantization of the electromagnetic field. Quantum theory of coherence, photon counting, photon states, lasers, density operators, and atomic Raman scattering. Prerequisite: PHY 576.

PHY 588 Quantum Optics. (3)*fall and spring*

Continuation of PHY 587. Prerequisite: PHY 587.

PHY 592 Research. (1–12)*not regularly offered***PHY 598 Special Topics. (1–4)***fall and spring*

Possible topics:

(a) Quantum Mechanics. (3)

spring

(b) Quantum Physics. (3)

*spring***PHY 599 Thesis. (1–12)***not regularly offered*

Department of Plant Biology

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PROFESSORS

ARNTZEN, BACKHAUS, FRASCH, HOOBER, KLOPATEK,
 NASH, SOMMERFELD, TRELEASE, VERMAAS, WEBBER

ASSOCIATE PROFESSORS

BRIGGS, CLARK, DAY, MARTIN, PIGG, RAMAKRISHNA,
 ROBERSON, STROMBERG, STUTZ, SZAREK, TOWILL

ASSISTANT PROFESSOR

RHOADS

RESEARCH PROFESSOR

WINICOV

ASSISTANT RESEARCH PROFESSORS

JOSHI, MOR

ASSOCIATE RESEARCH SCIENTISTS

BINGHAM, LoBRUTTO

ASSOCIATE RESEARCH SPECIALIST

SHARP

HERBARIUM CURATOR

LANDRUM

PLANT BIOLOGY—B.S.

The Department of Plant Biology provides four curricular options to meet the needs of students whose interests are in rapidly expanding areas within the life sciences. Students may choose the general program option which allows the opportunity to develop strength in one area or discipline. Others may choose to design a more specific, but interdisciplinary, program in one of the following three optional concentrations: environmental science and ecology, plant biochemistry and molecular biology, and urban horticulture.

Each concentration promotes interaction between diverse groups and captures the growing interdisciplinary nature of scientific investigations. When one of these options is chosen, the title will appear on transcripts and other university documents.

The four curricular options prepare students for careers in technical, industrial, and educational fields as well as professional degree programs in medicine or research and postgraduate education in the life sciences.

The Department of Plant Biology, in cooperation with the Department of Microbiology, also administers the newly developed B.S. degree program in Molecular Biosciences/Biotechnology. This major is for students interested in molecular and cellular biology and its application to biotechnology. For more information about this area of study, see "Molecular Biosciences and Biotechnology," page 415

General Program

The B.S. degree in Plant Biology consists of a minimum of 38 semester hours in plant biology and approved related fields.

PLB 200	Biology of Plants <i>SQ</i> *	3
PLB 201	Biology of Plants Laboratory <i>SQ</i> *	1
PLB 306	Plant Anatomy	4
PLB 308	Plant Physiology	4
BIO 320	Fundamentals of Ecology or BIO 340 General Genetics (4)	3
BIO 353	Cell Biology	3
PLB 484	Internship or PLB 499 Individualized Instruction (3)	3
Total		21–22

* Both PLB 200 and 201 must be taken to secure SQ credit.

Additional life or physical science elective courses, totaling from 15 to 20 semester hours, are also required.

Required supplemental courses in chemistry are as follows:

CHM 113	General Chemistry <i>SQ</i>	4
CHM 115	General Chemistry with Qualitative Analysis <i>SQ</i>	5
Choose between the organic chemistry course combinations below		4 or 8
CHM 231	Elementary Organic Chemistry <i>SQ</i> * (3)	
CHM 235	Elementary Organic Chemistry Laboratory <i>SQ</i> * (1)	
— or —		
CHM 331	General Organic Chemistry (3)	
CHM 332	General Organic Chemistry (3)	
CHM 335	General Organic Chemistry Laboratory (1)	
CHM 336	General Organic Chemistry Laboratory (1)	

Total 13 or 17

* Both CHM 231 and 235 must be taken to secure SQ credit.

Courses meeting the university mathematical studies requirement are as follows:

MAT 251	Calculus for Life Sciences <i>MA</i>	3
PLB 430	Statistical Analyses in Environmental Science <i>CS</i>	3
	or PLB 432 Computer Applications in Biology <i>CS</i> (3) or BIO 415 Biometry <i>CS</i> (4)	

Special Concentration Programs

Three special concentration programs are optional. Students who wish to pursue the general program in Plant Biology are not obligated to choose one of these specific programs. Each special concentration program is expected to be interdisciplinary and contain course work outside both the department and the College of Liberal Arts and Sciences. Each concentration includes hands-on technical training.

Environmental Science and Ecology. The B.S. degree in Plant Biology concentrating in environmental science and ecology consists of a minimum of 44 semester hours in plant biology and approved related fields.

The required major courses are as follows:

BIO 320	Fundamentals of Ecology	3
Choose between the geology course combinations below		4
GLG 101	Introduction to Geology (Physical) <i>SQ</i> , <i>G</i> ¹ (3)	
GLG 103	Introduction to Geology I—Laboratory <i>SQ</i> ¹ (1)	
— or —		
GLG 110	Environmental Geology <i>SG</i> , <i>G</i> ² (3)	
GLG 111	Environmental Geology Laboratory <i>SG</i> ² (1)	
GLG 362	Geomorphology	3
	or GLG 470 Hydrogeology (3)	
PLB 200	Biology of Plants <i>SQ</i> ³	3

PLB 201	Biology of Plants Laboratory <i>SQ</i> ³	1
PLB 310	The Flora of Arizona	4
PLB 322	Environmental Science (Major)	3
PLB 420	Plant Ecology: Organisms and Populations	3
	or PLB 421 Plant Ecology: Communities and Ecosystems (3)	
PLB 484	Internship	3
	or PLB 499 Individualized Instruction (3)	
Total	.....	27

¹ Both GLG 101 and 103 must be taken to secure SQ credit.

² Both GLG 110 and 111 must be taken to secure SG credit.

³ Both PLB 200 and 201 must be taken to secure SQ credit.

Required supplemental courses in biology and chemistry are as follows:

CHM 113	General Chemistry <i>SQ</i>	4
CHM 115	General Chemistry with Qualitative Analysis <i>SQ</i>	5
CHM 231	Elementary Organic Chemistry <i>SQ</i> *	3
CHM 235	Elementary Organic Chemistry Laboratory <i>SQ</i> *	1
Total	.....	13

* Both CHM 231 and 235 must be taken to secure SQ credit. Additional life or physical science elective courses, totaling 16 semester hours, are also required.

Courses meeting the university mathematical studies requirement are as follows:

MAT 251	Calculus for Life Sciences <i>MA</i>	3
PLB 430	Statistical Analyses in Environmental Science <i>CS</i>	3
	or PLB 432 Computer Applications in Biology <i>CS</i> (3)	

Plant Biochemistry and Molecular Biology. The B.S. degree in Plant Biology concentrating in biochemistry and molecular biology consists of 56 semester hours.

The required major courses are as follows:

BIO 353	Cell Biology	3
PLB 308	Plant Physiology	4
PLB 350	Applied Genetics	4
PLB 444	Plant Growth and Development	3
PLB 484	Internship	3
	or PLB 499 Individualized Instruction (3)	
Total	.....	17

Additional life or physical science elective courses, totaling from 11 to 14 hours, are also required.

Required supplemental courses in biology, chemistry, and physics are as follows:

Choose between the course combinations below..... 4 or 9

BCH 361 Principles of Biochemistry (3)
BCH 367 Elementary Biochemistry Laboratory (1)

— or —

BCH 461 General Biochemistry (3)
BCH 462 General Biochemistry (3)
BCH 467 Analytical Biochemistry Laboratory *L* (3)

CHM 113	General Chemistry <i>SQ</i>	4
CHM 115	General Chemistry with Qualitative Analysis <i>SQ</i>	5
CHM 231	Elementary Organic Chemistry <i>SQ</i> ¹	3
CHM 235	Elementary Organic Chemistry Laboratory <i>SQ</i> ¹	1
MBB 245	Cellular and Molecular Biology <i>SQ</i> ²	3
MBB 246	Cellular and Molecular Biology Laboratory <i>SQ</i> ²	1

PHY 111	General Physics <i>SQ</i> ³	3
PHY 113	General Physics Laboratory I <i>SQ</i> ³	1
Total	.....	25 or 30

¹ Both CHM 231 and 235 must be taken to secure SQ credit.

² Both MBB 245 and 246 must be taken to secure SQ credit.

³ Both PHY 111 and 113 must be taken to secure SQ credit.

Courses meeting the university mathematical studies requirement are as follows:

BIO 406	Computer Applications in Biology <i>CS</i>	3
MAT 251	Calculus for Life Sciences <i>MA</i>	3
MAT 351	Mathematical Methods for Genetic Analysis <i>CS</i>	3

Urban Horticulture. The B.S. degree in Plant Biology concentrating in urban horticulture consists of a minimum of 46 semester hours in plant biology and approved related fields.

PLB 306	Plant Anatomy	4
	or PLB 308 Plant Physiology (4) or BIO 320 Fundamentals of Ecology (3)	
PLB 200	Biology of Plants <i>SQ</i> *	3
PLB 201	Biology of Plants Laboratory <i>SQ</i> *	1
PLB 260	Plants in Cities: Introduction to Urban Horticulture <i>SG</i>	4
PLB 362	Landscape Plants	3
PLB 364	Urban Forestry	3
PLB 366	Interiorscape	3
	or PLB 372 Turf Management (3) or PLB 472 Greenhouse/Nursery Management (3)	
PLB 370	Environmental Landscape Management	3
PLB 414	Plant Pathology <i>L</i>	3
PLB 484	Internship	3
PLB 498	PS: Urban Horticulture	1
Total	.....	30–31

* Both PLB 200 and 201 must be taken to secure SQ credit.

Required supplemental courses in biology, chemistry, and soils are as follows:

CHM 101	Introductory Chemistry <i>SQ</i>	4
CHM 231	Elementary Organic Chemistry <i>SQ</i> *	3
CHM 235	Elementary Organic Chemistry Laboratory <i>SQ</i> *	1
Choose between the course combinations below..... 4		
ERS 130	Introduction to Environmental Science <i>SQ</i> (4)	
	— or —	
ERS 225	Soils (3)	
ERS 226	Soils Laboratory (1)	
Total	.....	12

* Both CHM 231 and 235 must be taken to secure SQ credit. Additional elective courses from other disciplines, totaling seven to eight semester hours are also required. A total of 54 semester hours are required for this curricular option.

Courses meeting the university mathematical studies requirement are as follows:

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

PLB 430 Statistical Analyses in Environmental Science <i>CS</i>	3
or PLB 432 Computer Applications in Biology <i>CS</i> (3)	
or BIO 415 Biometry <i>CS</i> (4)	
MAT 251 Calculus for Life Sciences <i>MA</i>	3
Total	6-7

PLANT BIOLOGY MINOR

The minor consists of a minimum of 24 semester hours. Required courses are as follows:

PLB 200 Biology of Plants <i>SQ</i> *	3
PLB 201 Biology of Plants Laboratory <i>SQ</i> *	1
PLB 306 Plant Anatomy	4
or PLB 308 Plant Physiology (4)	
or PLB 310 The Flora of Arizona (4)	
Total	8

* Both PLB 200 and 201 must be taken to secure *SQ* credit.

The remaining 12 hours are selected by the student through consultation with an academic advisor. Eight of these 12 hours must be in upper-division courses in the life sciences or other advisor-approved areas.

The minor can be designed after one of the four curricular options offered by the department. Courses not available for credit for majors in the life sciences cannot be used for the minor. This minor is not available to students in the life sciences.

GRADUATE PROGRAMS

The faculty in the Department of Plant Biology offer programs leading to the degrees of M.S. and Ph.D. The faculty also participate in programs leading to the Master of Natural Science degree when one of the concentrations is plant biology. The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. Other select faculty collaborate in the interdisciplinary concentration in ecology.

PLANT BIOLOGY (PLB)

PLB 108 Concepts in Plant Biology. (4)

fall, spring, summer

Introduction to concepts of plant biology that are of human relevance using commercially important, edible, and medicinal plants as examples. Not for majors in the biological sciences. 3 hours lecture, 3 hours lab. Fee.

General Studies: SQ

PLB 200 Biology of Plants. (3)

fall and spring

Analyzes the structure/function interaction for plant cells and tissues and properties that emerge in whole plants. Prerequisites: high school biology and chemistry.

General Studies: SQ (if credit also earned in PLB 201)

PLB 201 Biology of Plants Laboratory. (1)

fall and spring

Lab/field experiments to teach techniques and protocols of the scientific process; reinforces concepts from lecture by asking questions and solving problems. Lab. Prerequisites: high school biology and chemistry.

General Studies: SQ (if credit also earned in PLB 200)

PLB 300 Comparative Plant Diversity. (4)

fall

Survey of major plant groups and other photosynthetic organisms. Emphasis on comparative data analysis, evolutionary inference, and phylogenetic methods. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

General Studies: L/SG

PLB 302 Plants and Civilization. (3)

fall

Plants and plant products used by people throughout the world. Cultivation, processing, and uses in modern life (beverages, fibers, foods, medicinals, and perfumes). Prerequisites: preferably both PLB 200 and 201 (or 108) or only BIO 182 (or its equivalent).

PLB 304 Biology of Algae and Fungi. (3)

spring

Ecology, economics, and evolutionary diversity of the algae and fungi. Traditional and modern biotechnological uses. 2 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 305 Desert Annuals and Cacti. (3)

fall

Adaptive biology of select plants. Analysis of diverse traits permitting survival in deserts: reproduction, structure, and physiology. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 306 Plant Anatomy. (4)

fall

Development and mature structure of tissues of vascular plants; patterns and modifications of the leaf, stem, root, and flower. 3 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 308 Plant Physiology. (4)

spring

Concepts of plant function: carbon metabolism, energy acquisition, regulation of growth and development, stress responses, and water and nutrient uptake. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent); CHM 101 (or 115 or 231).

PLB 310 The Flora of Arizona. (4)

spring

Principles of taxonomy; identification of Arizona plants. 2 hours lecture, 6 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 400 Lichenology. (3)

spring in odd years

Chemistry, ecology, physiology, and taxonomy of lichens. 2 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 402 Mycology. (3)

spring

Fungal morphology and systematics with an introduction to fungal cell biology, ecology, economic significance, and growth and development. 2 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only MIC 206.

PLB 404 Phycology. (4)

spring

Algae (both fresh water and marine forms), emphasizing field collection and identification of local representatives. Morphological, ecological, and economic aspects of the algae. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 407 Plant Fossils and Evolution. (4)

spring in odd years

Broad survey of plant life of the past, including the structure of plant fossils, their geologic ranges, geographic distribution, and paleo-environment. 3 hours lecture, 3 hours lab or field trip. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 410 Angiosperm Taxonomy. (3)

spring

Principles underlying angiosperm phylogeny. 2 hours lecture, 3 hours lab. Prerequisite: PLB 310 or instructor approval.

PLB 411 Trees and Shrubs of Arizona. (3)

fall

Identification of woody plants from desert, chaparral, and forest habitats in Arizona. 1 hour lecture, 3 hours lab, field trips. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only instructor approval.

PLB 412 Cytogenetics. (3)

not regularly offered

Chromosomal basis of inheritance. Cross-listed as BIO 441. Credit is allowed for only BIO 441 or PLB 412. Prerequisite: BIO 340.

PLB 413 Cytogenetics Laboratory. (2)*not regularly offered*

Microscopic analysis of meiosis, mitosis, and aberrant cell division. 6 hours lab. Cross-listed as BIO 442. Credit is allowed for only BIO 442 or PLB 413. Pre- or corequisite: BIO 441 or PLB 412.

PLB 414 Plant Pathology. (3)*spring*

Identification and control of biotic and abiotic factors that cause common disease problems to plants. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only instructor approval.

*General Studies: L***PLB 416 Medical Botany. (4)***summer*

Explores plants affecting human health: modern- and folk-usage medicinal plants. Quality control, clinical evidence, plant chemistry, and ethnopharmacology. 3 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only instructor approval.

PLB 484 Internship. (3)*not regularly offered***PLB 498 Pro-Seminar. (1–7)***fall and spring*

Possible topics:

(a) Plant Biology Internship. (3)

Applies a simplified version of PLB 108 to teach fifth-grade children by planting gardens and conducting indoor plant experiments.

PLB 499 Individualized Instruction. (3)*not regularly offered***PLB 502 Perspectives in Plant Biology. (3)***fall*

Introduces major areas of research within the department with the goal of broadening knowledge to enable multidisciplinary research and communication. Prerequisite: instructor approval.

PLB 583 OTS: Fieldwork in Tropical Biology. (6–8)*spring and summer*

Intensive field-orientated classes with Organization for Tropical Studies (OTS) in Costa Rica with emphasis on research in ecology and systematics. Lecture, lab, fieldwork. Cross-listed as BIO 583. Credit is allowed for only BIO 583 or PLB 583. Prerequisites: graduate standing; a course in basic ecology.

PLB 591 Seminar. (1)*fall and spring***ENVIRONMENTAL SCIENCE AND ECOLOGY****PLB 320 Environmental Science (Nonmajor). (3)***fall*

Environmental and biological concepts used to understand ecological systems with specific references to problems caused by humans. Cannot be used for major credit in the biological sciences. Cross-listed as BIO 319. Credit is allowed for only BIO 319 or PLB 320.

*General Studies: G***PLB 322 Environmental Science (Major). (3)***fall*

Nature of environmental and biological interaction: historical and modern examples, regional and global issues. Participation in environmental problem-solving activities. Lecture, lab. Prerequisites: preferably both PLB 200 and 201 or both GLG 110 and 111 or only GPH 111.

PLB 420 Plant Ecology: Organisms and Populations. (3)*spring in odd years*

Factors and controls on the physiological ecology and organization of plants and plant populations using empirical and theoretical approaches. 2 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 320 or PLB 322 (or its equivalent).

PLB 421 Plant Ecology: Communities and Ecosystems. (3)*spring in even years*

Plant community organization, field sampling techniques and the structure and function of terrestrial ecosystems emphasizing the role of vegetation. 2 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 320 or PLB 322 (or its equivalent).

PLB 422 Plant Geography. (3)*not regularly offered*

Plant communities of the world and their interpretation, emphasizing North American plant associations. Cross-listed as GPH 422. Credit is allowed for only GPH 422 or PLB 422. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 or only GPH 111.

PLB 430 Statistical Analyses in Environmental Science. (3)*spring*

ANOVAS, 1-way classification of factorial and partially hierarchic designs; introductory multivariate statistics. Prerequisite: MAT 210 (or its equivalent).

*General Studies: CS***PLB 432 Computer Applications in Biology. (3)***fall*

Computer analysis techniques in biology emphasizing data entry, management and analysis, and graphic portrayal. Employs mainframe and microcomputers. 2 hours lecture, 3 hours lab. Cross-listed as BIO 406. Credit is allowed for only BIO 406 or PLB 432. Prerequisites: both BIO 182 and MAT 117 (or 210) or only instructor approval.

*General Studies: CS***PLB 434 Landscape Ecological Analysis and Modeling. (3)***spring in odd years*

Technical methods of landscape ecological analyses. Includes mathematical and statistical examination and modeling of landscape ecological patterns and processes. Prerequisites: both BIO 320 and 406 or only PLB 432 (or its equivalent).

PLB 520 Plant Structural Adaptation. (1–3)*not regularly offered*

Adaptive traits of leaf size/unique growth form on energy transfer efficiency; stomatal architecture and water-use efficiency; applications of stable isotopes. Prerequisite: BIO 320 or PLB 306 (or 308 or its equivalent).

PLB 522 Plant Photosynthetic Adaptation. (1–3)*not regularly offered*

Evolution and ecology of C4 and CAM; adaptive traits improving competitive ability in natural environments; comparative physiology of desert plants. Prerequisite: PLB 308 or instructor approval.

PLB 524 Methods in Environmental Plant Physiology. (3)*spring in odd years*

Techniques to measure and quantify microclimate and mass transfer. Supporting principles. 2 hours lecture, 3 hours lab. Prerequisite: BIO 320 or PLB 308.

PLANT BIOCHEMISTRY AND MOLECULAR BIOLOGY**PLB 340 Plant Cell Physiology. (4)***spring in odd years*

Surveys structural and biochemical aspects of plant cell function and the relationships of cell function to whole plant processes. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent); CHM 101 (or 115 or 231).

PLB 350 Applied Genetics. (4)*spring*

Introduction to molecular genetics with emphasis on application of genetics in solving biological questions and engineering organisms in biotechnology. 2 hours lecture, 6 hours lab. Cross-listed as MBB 350. Credit is allowed for only MBB 350 or PLB 350. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).

PLB 440 Photobiology. (3)*not regularly offered*

Principles underlying the effects of light on growth, development, and behavior of plants, animals, and microorganisms. Cross-listed as BIO 464. Credit is allowed for only BIO 464 or PLB 440. Prerequisites: CHM 231 (or 331); 12 hours in life sciences.

PLB 444 Plant Growth and Development. (3)*spring*

Molecular basis of development, role of signal transduction pathways/ gene regulation in control of organ formation, pollination, germination, and growth. Prerequisite: BIO 353 (PLB 340 recommended).

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

PLB 540 Plant Biochemistry. (3)*not regularly offered*

Structure/function relationships of molecules, emphasizing processes unique to plants: carbon fixation, synthesis of storage products, pigments, and secondary metabolites. Prerequisites: both BCH 361 and PLB 308 or only instructor approval.

PLB 550 Plant Molecular Biology. (2)*spring in odd years*

Biochemistry and molecular biology of plant organelles, including protein targeting, plant viruses, and molecular designs for plant improvements. Prerequisite: instructor approval.

PLB 552 Plant Genetic Engineering. (3)*spring*

Plant transformation utilization of transgenic plants, transient gene expression assays, and applications of plant genetic engineering. Prerequisite: instructor approval.

PLB 553 Plant Genetic Engineering Laboratory. (2)*spring*

Plant transformation, utilization of transgenic plants, transient gene expression assays, and applications of plant genetic engineering. 6 hours lab. Prerequisite: instructor approval.

PLB 554 Plant Biotechnology. (3)*not regularly offered*

Aseptic, clonal propagation of plants and in vitro culture of cells, organs, and tissues. 2 hours lecture, 3 hours lab. Prerequisite: PLB 308 or 340 or 370.

PLB 558 Molecular Mechanisms of Photosynthesis. (3)*spring*

Structure and function of photosynthetic complexes; mechanism of energy conversion in plants, bacteria, and model systems. Cross-listed as BCH 568. Credit is allowed for only BCH 568 or PLB 558. Prerequisite: instructor approval.

URBAN HORTICULTURE**PLB 260 Plants in Cities: Introduction to Urban Horticulture. (4)***spring*

Principles and practices of horticulture, emphasizing development, growth, and propagation of horticultural plants and environmental factors that affect these processes. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 (or 108) or only BIO 182. *General Studies: SG*

PLB 360 Southwest Home Horticulture. (2)*fall and spring*

Multimedia course for nonmajors surveying contemporary topics in Southwest home horticulture, including landscaping, flower and vegetable gardening, citriculture, interiorscaping, and others.

PLB 362 Landscape Plants. (3)*fall*

Identification, culture, and use of amenity plants in urban landscapes. Fee. Prerequisite: PLB 260 (or its equivalent).

PLB 363 Golf Course Landscape Plants and Design. (3)*fall and spring*

Identification, culture, and use of plants in a golf course setting. Cross-listed as AGB 367. Credit is allowed for only AGB 367 or PLB 363. Fee.

PLB 364 Urban Forestry. (3)*fall*

Establishment, care, and maintenance of ornamental trees, shrubs, and vines. Prerequisite: PLB 260 (or its equivalent).

PLB 366 Interiorscape. (3)*fall in even years*

Identification, culture, and use of container-grown plants for interior environments. Prerequisite: PLB 260 or instructor approval.

PLB 370 Environmental Landscape Management. (3)*fall*

Installation, irrigation, and maintenance of amenity plants in urban landscapes with an emphasis on integrated environmental landscape technologies. 2 hours lecture, 3 hours lab. Fee. Prerequisite: PLB 260 (or its equivalent).

PLB 372 Turf Management. (3)*not regularly offered*

Selection, establishment, and maintenance of turf grasses for lawn and sports areas. 2 hours lecture, 3 hours lab. Prerequisite: PLB 260 (or its equivalent).

PLB 472 Greenhouse/Nursery Management. (3)*spring in even years*

Greenhouse structures, environment, and nursery operation. Includes irrigation, nutrition, and other principles relative to container-grown species. Fee. Prerequisites: ERS 130 (or 225 or 226); PLB 260.

PLB 498 Pro-Seminar. (1-7)*not regularly offered*

Possible topics:

(a) Urban Horticulture. (1)

Department of Political Science**Robert L. Youngblood***Chair***(SS 410) 480/965-6551****www.asu.edu/clas/polisci**

PROFESSORS

BALL, BERMAN, CHAUDHURI, DAGGER, JONES,
McDONOUGH, McGOWAN, SIMON,
WALKER, YOUNGBLOOD

ASSOCIATE PROFESSORS

ASHLEY, CRITTENDEN, DANTICO, DOTY,
HERRERA, KAHN, KEATING, KENNEY, MITCHELL,
SIMHONY, SPRUYT, WARNER

ASSISTANT PROFESSORS

C. ELMAN, M. ELMAN, KRUTZ

POLITICAL SCIENCE—B.A.

The B.A. degree in Political Science consists of 42 semester hours, of which 30 must be in political science and 12 in related fields consisting of courses selected from the Departments of Anthropology, Chicana and Chicano Studies, Economics, Geography, History, Psychology, and Sociology, and the African American Studies and the Women's Studies programs. At least 15 hours in political science must be in upper-division courses.

The following courses are required:

POS 101	Political Ideologies <i>SB</i>	3
POS 110	Government and Politics <i>SB</i>	3
	or POS 310 American National Government <i>SB</i> (3)	
POS 150	Comparative Government <i>SB, G</i>	3
	or POS 160 Global Politics <i>SB, G</i> (3)	
POS 301	Empirical Political Inquiry <i>SB</i>	3
Total	.....	12

Students who major in Political Science must have a minimum GPA of 2.00 for all courses that count toward the major. Upper-division courses that count toward the major must have a grade of "C" or higher; no more than one "D" grade in a lower-division course may be counted in the major. See "College Degree Requirements," page 319. No more than six hours of POS 484 Internship may be applied to the major.

POLITICAL SCIENCE—B.S.

The B.S. degree in Political Science consists of 48 semester hours, of which 36 must be in political science and 12 in related fields consisting of courses selected from the Departments of Anthropology, Chicana and Chicano Stud-

ies, Economics, Geography, History, Psychology, and Sociology, and the African American Studies and the Women’s Studies programs. At least 21 hours in political science must be in upper-division courses.

The following courses are required:

POS 101 Political Ideologies <i>SB</i>	3
POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 150 Comparative Government <i>SB, G</i>	3
or POS 160 Global Politics <i>SB, G</i> (3)	
POS 301 Empirical Political Inquiry <i>SB</i>	3
POS 401 Political Statistics <i>CS</i>	3
Total	15

Students who major in Political Science must have a minimum GPA of 2.00 for all courses that count toward the major. Upper-division courses that count toward the major must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted in the major. See “College Degree Requirements,” page 319. No more than six hours of POS 484 Internship may be applied to the major.

B.S. in Political Science with a Concentration in Public Policy Analysis

This degree and concentration combination is intended for students with a strong interest in public policy. It is designed to help students develop perspectives and skills applicable to public policy analysis and program evaluation. This concentration consists of a minimum of 36 semester hours in political science and 12 hours in related fields.

Required Courses

POS 101 Political Ideologies <i>SB</i>	3
POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 150 Comparative Government <i>SB, G</i>	3
or POS 160 Global Politics <i>SB, G</i> (3)	
POS 220 Political Issues and Public Policy <i>SB</i>	3
POS 301 Empirical Political Inquiry <i>SB</i>	3
POS 325 Public Policy Development <i>SB</i>	3
POS 401 Political Statistics <i>CS</i>	3
POS 426 Elements of Public Policy <i>SB</i>	3
POS 484 Internship ¹	1-6
POS electives ²	6-9
Electives ³	12

¹ As approved by the political science internship coordinator.
² Additional POS elective courses are required.
³ In closely related fields, approved by a departmental academic advisor.

B.S. in Political Science with a Concentration in Public Policy Advocacy and Lobbying

This degree and concentration combination is intended for students interested in affecting public policy. It is designed to help students develop perspectives and skills useful to those engaged as activists in shaping public policy. This concentration consists of a minimum of 36 semester hours in political science and 12 hours in related fields.

Required Courses

POS 101 Political Ideologies <i>SB</i>	3
POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 150 Comparative Government <i>SB, G</i>	3
or POS 160 Global Politics <i>SB, G</i> (3)	
POS 220 Political Issues and Public Policy <i>SB</i>	3
or POS 325 Public Policy Development <i>SB</i> (3)	
or POS 426 Elements of Public Policy <i>SB</i> (3)	
POS 301 Empirical Political Inquiry <i>SB</i>	3
POS 313 The Congress <i>SB</i>	3
POS 333 Interest Groups <i>SB</i>	3
POS 401 Political Statistics <i>CS</i>	3
POS 484 Internship ¹	1-6
POS electives ²	6-9
Electives ³	12

¹ As approved by the political science internship coordinator.
² Additional POS elective courses are required.
³ In closely related fields, approved by a departmental academic advisor.

CERTIFICATES

Certificate in American Public Policy. The American Public Policy Certificate is designed for undergraduate students who are anticipating careers in government, public service, or public administration and/or who are interested in understanding the dynamics of policy making and administration in American government.

Students majoring in any subject at the university may pursue the American Public Policy Certificate. To be awarded the certificate, the student must complete at least 15 semester hours of political science courses as follows:

Choose one from the courses below	3
POS 110 Government and Politics <i>SB</i> (3)	
POS 310 American National Government <i>SB</i> (3)	
Choose two or three from the courses below	6 or 9
POS 220 Political Issues and Public Policy <i>SB</i> (3)	
POS 325 Public Policy Development <i>SB</i> (3)	
POS 426 Elements of Public Policy <i>SB</i> (3)	
Choose one or two from the courses below	3 or 6
POS 316 State and Local Government <i>SB</i> (3)	
POS 320 Public Administration <i>SB</i> (3)	
POS 410 Urban Government and Politics <i>SB</i> (3)	
POS 422 Politics of Bureaucracy <i>SB</i> (3)	
Choose up to one from the courses below	up to 3
POS 313 The Congress <i>SB</i> (3)	
POS 314 American Presidency <i>SB</i> (3)	
POS 484 Internship (up to 3 semester hours for a policy/administration-related internship) (3)	
Total	15

Certificate students must have a minimum GPA of 2.00; only courses in which students have a grade of “C” or higher count toward the certificate.

Asian Studies Certificate or Emphasis. Students majoring in Political Science may elect to pursue an Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content. See “Asian Studies,” page 324, for more information.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Certificate in Civic Education. The Civic Education Certificate is designed to contribute to the preparation of undergraduate students for

1. careers in primary and secondary education (where the teaching of government and civics may be involved);
2. careers or voluntary participation in politics, public service, and civic and social movements; and
3. further education in law, journalism, business, history, sociology, political science, and other fields where an understanding of questions of citizenship, leadership, community, democracy, public responsibility, and ethics is crucial.

The certificate does not substitute for degree requirements in any subject, including Political Science; rather, as a complement to the student's chosen major, the certificate program is intended to guide students to a variety of courses whose successful completion indicates their special accomplishment in the area of civic education.

Students majoring in any subject at the university may be awarded the Civic Education Certificate upon completion of the following 15 semester hours of political science courses:

POS 101 Political Ideologies <i>SB</i>	3
POS 346 Problems of Democracy <i>HU</i>	3
POS 442 American Political Thought <i>HU</i>	3
Choose one from the courses below	3
POS 340 History of Political Philosophy I <i>HU, H</i> (3)	
POS 341 History of Political Philosophy II <i>HU, H</i> (3)	
POS 443 Topics in Contemporary Political Theory <i>HU</i> (3)	
Choose one from the courses below	3
POS 110 Government and Politics <i>SB</i> (3)	
POS 150 Comparative Government <i>SB</i> (3)	
POS 160 Global Politics <i>SB, G</i> (3)	
POS 270 American Legal System <i>SB</i> (3)	
POS 300 Contemporary Controversies in Global Politics (3)	
POS 313 The Congress <i>SB</i> (3)	
POS 314 The American Presidency <i>SB</i> (3)	
POS 315 The Supreme Court <i>SB</i> (3)	
POS 330 Contemporary Controversies in Domestic Politics <i>SB</i> (3)	
POS 332 American Political Parties <i>SB</i> (3)	
POS 333 Interest Groups <i>SB</i> (3)	
POS 370 Law and Society <i>SB</i> (3)	
POS 417 The Arizona Political System <i>SB</i> (3)	
POS 435 Women and Politics <i>SB</i> (3)	
POS 439 Minority Group Politics in America <i>SB, C</i> (3)	
Total	15

Certificate students must have a minimum GPA of 2.00; only courses in which students have a grade of "C" or higher count toward the certificate.

Certificate in International Studies. The International Studies Certificate is designed to prepare students for careers in government agencies, international governmental and nongovernmental organizations, multinational firms and banks, and for graduate studies in International Relations or Political Science. The certificate is not a substitute for degree requirements in any subject, including political science; rather, the required courses add an international and comparative dimension to the student's chosen major.

Requirements for the certificate are intended to provide an understanding of international relations and comparative government, an awareness of global social and political-

economic processes, and sensitivity to foreign political systems and cultures. These objectives are met by a sequence of political science courses in the areas of international relations, comparative politics, and area studies.

Students majoring in any subject at the university may be awarded the International Studies Certificate upon completion of the following 15 semester hours of political science courses:

Choose one from the courses below	3
POS 150 Comparative Government <i>SB, G</i> (3)	
POS 160 Global Politics <i>SB, G</i> (3)	
Choose one from the courses below	3
POS 361 American Foreign Policy <i>SB, G</i> (3)	
POS 364 U.S. National Security Analysis <i>SB</i> (3)	
Choose two from the courses below	6
POS 300 Contemporary Controversies in Global Politics (3)	
POS 465 International Organization and Law <i>SB, G</i> (3)	
POS 467 International Security <i>SB, G</i> (3)	
POS 486 International Political Economy <i>SB</i> (3)	
Choose one from the courses below	3
POS 350 Comparative Politics <i>SB, G</i> (3)	
POS 355 Russia and Successor States <i>SB, G</i> (3)	
POS 356 Western Europe <i>SB, G</i> (3)	
POS 357 South Asia Politics <i>SB, G</i> (3)	
POS 358 Southeast Asia <i>SB, G</i> (3)	
POS 359 African Politics and Society <i>SB, G</i> (3)	
POS 360 World Politics <i>SB, G</i> (3)	
POS 451 China, Japan, and the Koreas <i>SB, G</i> (3)	
POS 452 China <i>SB, G</i> (3)	
POS 453 South America <i>SB, G</i> (3)	
POS 454 Mexico <i>SB, G</i> (3)	
POS 455 Central America and the Caribbean <i>SB, G</i> (3)	
POS 459 South and Southern Africa <i>SB, G</i> (3)	
POS 463 Inter-American Relations <i>SB, G</i> (3)	
POS 468 Comparative Asian Foreign Policies <i>SB, G</i> (3)	
Total	15

Honors students who select an international topic for their theses may apply thesis credit toward the 15 hours of international course work for the certificate.

Depending upon their interests, certificate students are strongly advised to take 12 semester hours or more from appropriate courses in anthropology (ASB), economics (ECN), geography (GCU), history (HST), international business studies (IBS), and sociology (SOC). Knowledge of a modern foreign language equivalent to at least two years of college study is strongly recommended.

Certificate students must have a minimum GPA of 2.00; only courses in which students have a grade of "C" or higher count toward the certificate.

Latin American Studies Certificate or Emphasis. Students majoring in Political Science may elect to pursue a Latin American Studies Certificate combining courses from the major with selected outside courses of wholly Latin American content. See "Latin American Studies," page 326, for more information.

MINOR IN POLITICAL SCIENCE

The minor in Political Science consists of 18 semester hours in political science courses, 12 hours of which must be upper-division courses. Students who minor in Political Science must have two courses from among the following:

POS 101 Political Ideologies <i>SB</i>	3
POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 150 Comparative Government <i>SB, G</i>	3
POS 160 Global Politics <i>SB, G</i>	3

Students who minor in Political Science must have a minimum GPA of 2.00 for all courses that count toward the minor. Upper-division courses that count toward the minor must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted toward the minor. No more than three hours of POS 484 Internship and three hours of POS 499 Individualized Instruction may be applied to the minor.

SECONDARY EDUCATION—B.A.E.

Political Science. The major teaching field consists of 45 semester hours, 30 of which must be in political science and 15 in closely related fields.

The following courses are required:

POS 101 Political Ideologies <i>SB</i>	3
POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 150 Comparative Government <i>SB, G</i>	3
or POS 160 Global Politics <i>SB, G</i> (3)	
POS 301 Empirical Political Inquiry <i>SB</i>	3
POS 417 The Arizona Political System <i>SB</i>	3
POS 480 Methods of Teaching Government	3
Total	18

Courses may be substituted for POS 417 and 480 with departmental approval.

Students who pursue this academic specialization in political science must have a minimum GPA of 2.00 for all courses that count toward the major. Upper-division courses that count toward the major must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted in the academic specialization. No more than six hours of POS 484 Internship may be applied to the major.

The minor teaching field consists of 24 semester hours in political science courses.

The following six courses are required:

POS 101 Political Ideologies <i>SB</i>	3
POS 110 Government and Politics <i>SB</i>	3
or POS 310 American National Government <i>SB</i> (3)	
POS 150 Comparative Government <i>SB, G</i>	3
or POS 160 Global Politics <i>SB, G</i> (3)	
POS 301 Empirical Political Inquiry <i>SB</i>	3
POS 417 The Arizona Political System <i>SB</i>	3
POS 480 Methods of Teaching Government	3
Total	18

Courses may be substituted for POS 417 and 480 with departmental approval.

Students who pursue this academic specialization in political science must have a minimum GPA of 2.00 for all courses that count toward the academic specialization. Upper-division courses that count toward the academic specialization must have a grade of “C” or higher; no more than

one “D” grade in a lower-division course may be counted in the minor.

Social Studies. See “Social Studies,” page 446.

GRADUATE PROGRAMS

The faculty in the Department of Political Science offer programs leading to the M.A. and Ph.D. degrees. See the *Graduate Catalog* for requirements.

POLITICAL SCIENCE (POS)

POS 101 Political Ideologies. (3)

fall and spring

Leading political ideas and belief systems, e.g., Marxism, liberalism, conservatism, theories of democracy, and alternative futures.

General Studies: SB

POS 110 Government and Politics. (3)

fall and spring

Major institutions of modern government and processes of individual and group political activity, with emphasis on the American experience. Meets the federal government requirement for teacher certification. Credit is allowed for only POS 110 or 310.

General Studies: SB

POS 150 Comparative Government. (3)

fall and spring

Political institutions and processes in selected foreign countries, including origins, strengths, and weaknesses of contemporary political systems and political development.

General Studies: SB, G

POS 160 Global Politics. (3)

fall and spring

Nature of contemporary world politics through the study of both general theoretical topics and specific geographical areas.

General Studies: SB, G

POS 220 Political Issues and Public Policy. (3)

once a year

Contemporary social problems and political issues, particularly development of public policy.

General Studies: SB

POS 230 Current Issues in National Politics. (3)

fall and spring

Major issues facing national governments in the domestic field. Prerequisite: ENG 101 (or 105).

General Studies: L/SB

POS 240 Introduction to Southeast Asia. (3)

fall

Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/GCU 240/HST 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.

General Studies: G

POS 260 Current Issues in International Politics. (3)

fall and spring

Analyzes major current problems in world politics. Prerequisite: ENG 101 (or 105).

General Studies: L/SB, G

POS 270 American Legal System. (3)

fall and spring

Concepts, institutions, classifications, and functions of law. Role of the courts and impact of judicial decision making on social change.

General Studies: SB

POS 300 Contemporary Controversies in Global Politics. (3)

fall and spring

Explores key controversies in global politics including security, economic stability, poverty, gender, race, and the environment.

General Studies: SB, G

POS 301 Empirical Political Inquiry. (3)*fall and spring*

Logic of political inquiry, including research problems, concepts, hypotheses, theories, measurement, data collection, and analysis.

*General Studies: SB***POS 310 American National Government. (3)***fall and spring*

Powers, functions, and agents of American political institutions. Meets the federal government requirement for teacher certification. Credit is allowed for only POS 310 or 110.

*General Studies: SB***POS 311 Arizona Constitution and Government. (2)***fall and spring*

Constitution and government of the State of Arizona. Credit is allowed for only POS 311 or 316 or 417. Meets the Arizona constitution requirement for teacher certification. May not be counted for the major or a teaching major or minor in Political Science.

POS 313 The Congress. (3)*once a year*

Lawmaking process in the U.S. Congress.

*General Studies: SB***POS 314 The American Presidency. (3)***once a year*

Office, role, and power of the American presidency in the American political system.

*General Studies: SB***POS 315 The Supreme Court. (3)***once a year*

Role of the Supreme Court in American society and politics; examination of decision-making process and impact of decisions; restraint versus activism.

*General Studies: SB***POS 316 State and Local Government. (3)***once a year*

Survey of the operations, problems, and policies of state and local governments in the United States. Credit is allowed for only POS 316 or 311.

*General Studies: SB***POS 320 Public Administration. (3)***once a year*

Role of the administrator in the political process with an examination of the basic concepts of bureaucracy.

*General Studies: SB***POS 325 Public Policy Development. (3)***once a year*

Examines one or more aspects of public policy development including agenda setting, policy formulation, policy implementation, and policy analysis.

*General Studies: SB***POS 330 Contemporary Controversies in Domestic Politics. (3)***fall and spring*

Explores key controversies in domestic politics including the environment, the economy, poverty, gender, race, and security.

*General Studies: SB***POS 331 Public Opinion. (3)***once a year*

Formation, expression, and influence of individual and organized opinion on political institutions.

*General Studies: SB***POS 332 American Political Parties. (3)***once a year*

Development of the American party system. Party organization and functions.

*General Studies: SB***POS 333 Interest Groups. (3)***once a year*

Examines how minority, corporate, labor, farm, consumer, environmental, health, education and public interest groups, and single-issue movements influence government.

*General Studies: SB***POS 336 Electoral Behavior. (3)***once a year*

Voting behavior and the attitudes, perceptions, and activities of the citizenry in the political process.

*General Studies: SB***POS 340 History of Political Philosophy I. (3)***once a year*

Western political philosophers and their theories to the 17th century.

*General Studies: HU, H***POS 341 History of Political Philosophy II. (3)***once a year*

Western political philosophers and their theories from the 17th to the 20th centuries.

*General Studies: HU, H***POS 346 Problems of Democracy. (3)***once a year*

Issues and problems in democratic theory, e.g., the nature of democracy, majority rule, representation, equality, and the value of political participation.

*General Studies: HU***POS 350 Comparative Politics. (3)***once a year*

Theoretical approaches and political institutions, such as parties, pressure groups, legislatures, and executives, from a cross-national perspective.

*General Studies: SB, G***POS 351 Democratization. (3)***fall*

Examines the consolidation of democracies in postauthoritarian and postcommunist settings (e.g., Latin America, Eastern Europe, Asia).

POS 355 Russia and Successor States. (3)*once a year*

Description and analysis of political institutions and practices in Russia and successor states.

*General Studies: SB, G***POS 356 Western Europe. (3)***once a year*

Structures and behavior of governmental institutions and political processes in selected countries of Western Europe.

*General Studies: SB, G***POS 357 South Asia Politics. (3)***once a year*

Analyzes the political culture, politics, and political systems of South Asia. Lecture, discussion.

*General Studies: SB, G***POS 358 Southeast Asia. (3)***once a year*

Political background, governmental institutions, political dynamics, and developmental problems of Southeast Asian nations.

*General Studies: SB, G***POS 359 African Politics and Society. (3)***not regularly offered*

Comparative analysis of socioeconomic forces, political processes, and government institutions in Africa south of the Sahara.

*General Studies: SB, G***POS 360 World Politics. (3)***once a year*

Theory and practice of statecraft as applied to selected issues, regions, or eras.

*General Studies: SB, G***POS 361 American Foreign Policy. (3)***once a year*

United States in world affairs; foreign policy since World War I. Techniques in formulating American foreign policies.

*General Studies: SB, G***POS 364 U.S. National Security Analyses. (3)***once a year*

Theoretical and empirical assessment of U.S. national security policy in the post-cold war era.

*General Studies: SB***POS 370 Law and Society. (3)***once a year*

Analyzes debates among social scientists and legal theorists concerning the relationship between "law" and "society."

*General Studies: SB***POS 401 Political Statistics. (3)***fall and spring*

Basic concepts in statistics as they facilitate the description, explanation, and prediction of social and political phenomena.

General Studies: CS

POS 410 Urban Government and Politics. (3)*once a year*

Governmental organizations, decision-making structures, and problems of urban political systems.

*General Studies: SB***POS 417 The Arizona Political System. (3)***not regularly offered*

Contemporary political problems within the context of Arizona's constitutional, political, and social frameworks. Meets the Arizona Constitution requirement for teacher certification. Credit is allowed for only POS 417 or 311.

*General Studies: SB***POS 422 Politics of Bureaucracy. (3)***not regularly offered*

Bureaucracy as a political entity; internal dynamics of public agencies; the relationship between public agencies and other political entities.

*General Studies: SB***POS 423 Politics of Budgeting. (3)***not regularly offered*

Policy process in budgeting; strategies used to influence this process; recent reforms in public budgeting.

*General Studies: SB***POS 426 Elements of Public Policy. (3)***once a year*

Each section may cover one of the following topics: consumer protection, natural resources, criminal justice, environmental protection, science and technology, or theories of public policy. May be repeated for credit when topics vary.

*General Studies: SB***POS 431 Campaigns and Elections. (3)***once a year*

Examines campaigns from a multitude of perspectives including the politician, reporter, campaign strategist, and voter. Lecture, discussion.

*General Studies: SB***POS 433 Money and Politics. (3)***once a year*

Role of money and special interests in elections, campaign politics, and public policy-making in American politics. Lecture, discussion.

*General Studies: SB***POS 434 Media and Politics. (3)***once a year*

Studies mass media and politics in the United States, e.g., media and elections, media and government. Lecture, discussion.

*General Studies: SB***POS 435 Women and Politics. (3)***not regularly offered*

Women's roles in various political contexts. Focus varies with instructor.

*General Studies: SB, C***POS 439 Minority Group Politics in America. (3)***not regularly offered*

Role of minority groups in American politics.

*General Studies: SB, C***POS 442 American Political Thought. (3)***once a year*

Political theories and movements from the colonial period to the present.

*General Studies: HU***POS 443 Topics in Contemporary Political Theory. (3)***once a year*

Major problems and theories in contemporary political thought.

*General Studies: HU***POS 445 Asian Political Thought. (3)***once a year*

Contemporary political ideas and theories in selected Asian countries, including the impact of Marxist and non-Marxist theories on revolutionary processes.

*General Studies: SB, G***POS 451 China, Japan, and the Koreans. (3)***once a year*

Comparative analysis of the political modernization experiences of China, Japan, and the two Koreas, focusing on their differing reactions to the West.

*General Studies: SB, G***POS 452 China. (3)***once a year*

Background of the Communist revolution, political processes, and developmental problems in China from a comparative perspective.

*General Studies: SB, G***POS 453 South America. (3)***once a year*

Governmental institutions, political processes, and developmental problems of the South American states.

*General Studies: SB, G***POS 454 Mexico. (3)***once a year*

Mexican federal, state, and local governmental institutions.

*General Studies: SB, G***POS 455 Central America and the Caribbean. (3)***once a year*

Governmental institutions, political processes, and developmental problems of the nation-states and dependent areas of Central America and the Caribbean.

*General Studies: SB, G***POS 459 South and Southern Africa. (3)***once a year*

Post-apartheid South African government and politics; South Africa and the southern African region; regional security and development.

*General Studies: SB, G***POS 463 Inter-American Relations. (3)***once a year*

Diplomatic relations toward the Latin American states. Development of U.S. foreign policy toward Latin America.

*General Studies: SB, G***POS 465 International Organization and Law. (3)***once a year*

History, practical political significance, and future of international institutions, transnational regimes, and international law.

*General Studies: SB, G***POS 467 International Security. (3)***once a year*

Examines issues affecting the international security of states and peoples, e.g., military, economic, technological, environmental, and demographic.

*General Studies: SB, G***POS 468 Comparative Asian Foreign Policies. (3)***once a year*

Foreign policies of the Asian states, emphasizing their security relations and movements toward regionalism.

*General Studies: SB, G***POS 471 Constitutional Law I. (3)***once a year*

Development of the U.S. Constitution as reflected in decisions of the Supreme Court; jurisdiction and organization of the federal courts; judicial review; separation of powers; federalism; the commerce clause; national taxing and spending power; state police power.

*General Studies: SB***POS 472 Constitutional Law II. (3)***once a year*

Development of the U.S. Constitution as reflected in decisions of the Supreme Court; due process; equal protection of laws; individual rights; civil liberties.

*General Studies: SB***POS 480 Methods of Teaching Government. (3)***not regularly offered*

Methods of instruction, organization, and presentation of subject matter in political science. Prerequisite: 15 hours in political science or instructor approval.

POS 484 Internship. (1–12)*not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

POS 485 Political Economy. (3)*once a year*

Problems, policies, and possibilities of various political-economic systems and the interrelationship of capitalism, socialism, and democracy.

*General Studies: SB***POS 486 International Political Economy. (3)***once a year*

Contending approaches to historical and contemporary issues of international political economy, including global welfare, equality, ecology, and peace.

*General Studies: SB, G***POS 498 Pro-Seminar. (3)***once a year*

Small group study and research for advanced students within their major area. Prerequisite: major in the department or instructor approval.

*General Studies: L***POS 499 Individualized Instruction. (3)***not regularly offered***POS 501 Methods of Political Science. (3)***not regularly offered*

Problems of method and knowledge in political science, strategies of political inquiry, and issues in philosophy of social science.

POS 502 Philosophy of Political Inquiry. (3)*once a year*

Problems of knowledge and method in political science, with attention to both empirical and evaluative analysis.

POS 503 Empirical Political Inquiry. (3)*once a year*

Research methods and techniques of the discipline, emphasizing empirical foundations and analytic methods employed in subfields. Prerequisites: POS 401 (or its equivalent); instructor approval.

POS 530 American Politics. (3)*once a year*

Examines major debates in the study of American political processes and institutions. Covers parties, media, elections, public opinion, interest groups, and the three branches of government. Seminar.

POS 545 Themes in Political Thought. (3)*not regularly offered*

Examines a particular theme or problem in political thought from both a historical and contemporary perspective. May be repeated with approval of the director of graduate studies. Seminar. Prerequisite: instructor approval.

POS 550 Comparative Politics. (3)*once a year*

Surveys major approaches across topical areas such as revolutions, authoritarianism, policy processes, interest groups, and electoral politics. Focus varies with instructor. Seminar.

POS 560 International Relations. (3)*once a year*

Surveys major theoretical approaches and debates in international relations. Seminar.

POS 563 Comparative Asian Security Policies. (3)*not regularly offered*

Analyzes domestic and international constraints, belief systems, and economic components in security decisions by major powers and Asian nations. Seminar. Prerequisite: instructor approval.

POS 590 Reading and Conference. (1–12)*not regularly offered***POS 591 Seminar. (1–12)***once a year*

Possible topics:

- (a) American Politics. (3)
- (b) Comparative Politics. (3)
- (c) Global Politics. (3)
- (d) Political Theory. (3)

POS 592 Research. (1–12)*not regularly offered***POS 598 Special Topics. (1–4)***once a year*

Possible topics:

- (a) American Politics. (3)
- (b) Comparative Politics. (3)
- (c) Global Politics. (3)
- (d) Political Theory. (3)

POS 599 Thesis. (1–12)*not regularly offered***POS 601 Advanced Experimental Research. (3)***not regularly offered*

Introduces experimental and quasi-experimental research designs in political research, including laboratory techniques and topics in the analysis of variance. Prerequisite: POS 503 (or its equivalent).

POS 602 Advanced Survey Research. (3)*not regularly offered*

Presents design and conduct of political surveys, including sampling, instrument design, scaling, and statistical and graphical analysis of survey data. Prerequisite: POS 503 (or its equivalent).

POS 603 Polimetrics I. (3)*once a year*

Introduces theory and practice of linear regression analysis. Provides skills to read, understand, and evaluate professional literature using regression analysis. Prerequisites: both POS 401 and 503 or only instructor approval.

POS 604 Polimetrics II. (3)*once a year*

Applies quantitative techniques to research topics producing publishable papers through exposure to time-series, logit and probit, and simultaneous equations. Prerequisites: a combination of POS 401 and 503 and 603 or only instructor approval.

POS 606 Qualitative and Textual Analysis. (3)*spring in odd years*

Method and theory for the analysis of qualitative materials, systematic approaches for case studies, content analysis, critical analysis of texts. Discussion, seminar.

POS 635 State Politics and Public Policy. (3)*not regularly offered*

Introduction to comparative state policy emphasizing policy or performance differences among the states and the reasons for these differences. Seminar. Prerequisites: both POS 530 and 603 or only instructor approval.

POS 636 Electoral Behavior. (3)*not regularly offered*

Introduces fundamental concepts of electoral behavior. Emphasizes presidential elections and examines why people vote and how their votes are determined. Seminar. Prerequisites: both POS 530 and 603 or only instructor approval.

POS 638 Law and Politics. (3)*not regularly offered*

Emphasizes research into such topics as constitutional law, women and the law, American legal system, judicial process, and judicial selection. Seminar. Prerequisite: instructor approval.

POS 651 Politics of Change and Development. (3)*not regularly offered*

Examines contending approaches to national, social, and political change. Seminar. Prerequisite: instructor approval.

POS 660 The Modern World System. (3)*not regularly offered*

Theoretically driven, historical analysis of the organization and operation of the international political economy since the 16th century. Seminar. Prerequisite: instructor approval.

POS 661 The State. (3)*not regularly offered*

Examines theories of state, state-society relations, and interstate politics emphasizing questions of sovereignty, territoriality, violence, representation, democracy, and change. Seminar. Prerequisite: instructor approval.

POS 662 International Organization. (3)*not regularly offered*

History, practical political significance, and future of international institutions, transnational regimes, and other approaches to international organization. Seminar. Prerequisite: instructor approval.

- POS 664 War, Peace, and Conflict Processes. (3)**
not regularly offered
 Systematic analysis of the causes of war, the preconditions for peace, and approaches to the resolution of conflict. Seminar. Prerequisite: instructor approval.
- POS 665 Foreign Policy Theory. (3)**
not regularly offered
 Examines foreign policy theory and methods. Development and critique of research designs analyzing foreign policy processes within and among nations. Seminar. Prerequisite: instructor approval.
- POS 691 Seminar. (1–12)**
not regularly offered
- POS 790 Reading and Conference. (1–12)**
not regularly offered
- POS 792 Research. (3)**
fall and spring
 Projects in various areas of political science. Prerequisite: doctoral student.

Department of Psychology

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 BARTON, WEIGAND, WOSINSKI

LECTURER
 PALMER

The Department of Psychology maintains an Undergraduate Advisement Office staffed by trained personnel. All Psychology majors are encouraged to meet with an undergraduate advisor once each semester to ask questions regarding the choice of courses. Failure to do so may prevent graduation at the expected time. It is the responsibility of the student to consult with an undergraduate advisor.

PSYCHOLOGY—B.A.

The B.A. degree in Psychology consists of 31 semester hours in psychology, including at least 15 upper-division semester hours. Required courses, which must be passed with a minimum grade of “C,” are as follows:

PGS	101	Introduction to Psychology <i>SB</i>	3
PGS	315	Personality Theory and Research <i>SB</i>	3
		or PGS 341 Developmental Psychology <i>SB</i> (3) or PGS 350 Social Psychology <i>SB</i> (3)	
PSY	230	Introduction to Statistics <i>CS</i>	3
PSY	290	Research Methods <i>L/SG</i>	4
PSY	323	Sensation and Perception	3
		or PSY 320 Learning and Motivation (3) or PSY 324 Memory and Cognition (3) or PSY 325 Physiological Psychology (3)	
Total			16

Also required are one additional upper-division PSY course (excluding PSY 484, 492, 493, 497, and 499); two additional upper-division PGS or PSY courses; and two additional psychology courses (excluding PGS 194, 270, 484, and PSY 484 and 497). A maximum of three hours in Supervised Research or Individualized Instruction may be used to complete the 31 hours of psychology requirements. Students may take a maximum of six hours of PGS or PSY 399 and six hours of PGS 499 and PSY 499 combined. Eighteen hours in courses related to psychology must be passed with a minimum grade of “C.” They must be approved by an undergraduate advisor and include MAT 119 (or higher) in addition to one course from among the following:

CSE	180	Computer Literacy <i>CS</i>	3
CSE	185	Internet and the World Wide Web	3

See “College Degree Requirements,” page 319.

PSYCHOLOGY—B.S.

The B.S. degree in Psychology consists of 31 semester hours in psychology, including at least 15 upper-division hours. Required courses, which must be passed with a minimum grade of “C,” are as follows:

PGS	101	Introduction to Psychology <i>SB</i>	3
PGS	315	Personality Theory and Research <i>SB</i>	3
		or PGS 341 Developmental Psychology <i>SB</i> (3) or PGS 350 Social Psychology <i>SB</i> (3)	
PSY	230	Introduction to Statistics <i>CS</i>	3
PSY	290	Research Methods <i>L/SG</i>	4
PSY	323	Sensation and Perception	3
		or PSY 320 Learning and Motivation (3) or PSY 324 Memory and Cognition (3) or PSY 325 Physiological Psychology (3)	
Total			16

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Also required are one additional upper-division PSY course (excluding PSY 484, 492, 493, 497, and 499); two additional upper-division PGS or PSY courses; and two additional psychology courses (excluding PGS 194, 270, and 484, and PSY 484 and 497). A maximum of three semester hours of Supervised Research (PGS or PSY 399, PGS or PSY 499, or PSY 492) and a maximum of three hours of Honors Thesis (PSY 493) can be used to satisfy major requirements. Students may take a maximum of six hours of PGS or PSY 399 and six hours of PGS 499 and PSY 499 combined. Eighteen hours in courses related to psychology must be passed with a minimum grade of "C." They must be approved by an undergraduate advisor and include MAT 210 Brief Calculus (or higher); one life science lab course (BIO or MIC); one physical science lab course (AST, CHM, GLG, or PHY); and one course from among the following:

CSE 180 Computer Literacy CS.....	3
CSE 185 Internet and the World Wide Web	3

Further, the science courses taken to satisfy the B.S. degree requirements cannot be used to meet the science (SQ or SG) portion of the university General Studies requirement.

MINOR IN PSYCHOLOGY

The minor in Psychology consists of 22 hours in psychology, including the following:

PGS 101 Introduction to Psychology SB.....	3
PGS 315 Personality Theory and Research SB	3
or PGS 341 Developmental Psychology SB (3)	
or PGS 350 Social Psychology SB (3)	
PSY 230 Introduction to Statistics CS.....	3
PSY 290 Research Methods L/SG.....	4
PSY 323 Sensation and Perception	3
or PSY 320 Learning and Motivation (3)	
or PSY 324 Memory and Cognition (3)	
or PSY 325 Physiological Psychology (3)	
Total	16

Two additional upper-division PGS or PSY courses are required.

A maximum of three semester hours of Supervised Research (PGS or PSY 399, PGS or PSY 499, or PSY 492) and a maximum of three hours of Honors Thesis (PSY 493) can be used to satisfy minor requirements. Students with an appropriate equivalent course may exclude PSY 230 from the requirements. All courses must be passed with a minimum grade of "C."

SECONDARY EDUCATION—B.A.E.

Psychology. The minor teaching field consists of 24 semester hours. See a departmental advisor.

Social Studies. See "Social Studies," page 446.

GRADUATE PROGRAMS

The faculty in the Department of Psychology offer a program leading to the Ph.D. degree. See the *Graduate Catalog* for requirements.

PSYCHOLOGY (PGS)

PGS 101 Introduction to Psychology. (3)

fall, spring, summer

Major areas of theory and research in psychology. Requires participation in department-sponsored research or an educationally equivalent alternative activity.

General Studies: SB

PGS 194 Special Topics. (1–4)

not regularly offered

PGS 222 Human Sexual Behavior. (3)

fall and spring

Patterns of sexual behavior, including variations and deviations; theories of sexual attraction, sex differences, and sexual dysfunction and treatment. Prerequisite: PGS 101.

General Studies: SB

PGS 270 Psychology of Adjustment. (3)

fall, spring, summer

Principles of mental health, adjustment, conflict, stress, and coping processes derived from clinical and experimental research. Intended for nonmajors; cannot be used for major credit. Prerequisite: PGS 101.

General Studies: SB

PGS 304 Effective Thinking. (3)

once a year

Understanding and improving intellectual and behavioral skills; information analysis, inference, logic, problem solving, and decision making. Prerequisite: MAT 119 or PSY 230 (or its equivalent).

General Studies: L

PGS 306 Environmental Psychology. (3)

fall, spring, summer

Concepts and research strategies in the study of behavior in interaction with physical environment. Prerequisite: PGS 101.

General Studies: SB

PGS 315 Personality Theory and Research. (3)

fall, spring, summer

Definition and description of personality in terms of theoretical and methodological approaches. Prerequisites: PGS 101; PSY 290.

General Studies: SB

PGS 341 Developmental Psychology. (3)

fall and spring

Analyzes behavior development in terms of psychological principles. Current research in human development. Prerequisites: PGS 101; PSY 290.

General Studies: SB

PGS 344 Directed Child Study. (3–4)

fall, spring, summer

Theories and methods of intervention with preschool children and supervised practicum in the Child Study Laboratory. 1 hour lecture, 6–8 hours practicum. Prerequisites: CDE 232; ECD 314 (or PSY 290).

PGS 350 Social Psychology. (3)

fall, spring, summer

Human social behavior, including such concepts as aggression, attraction, attribution, conformity, groups, helping, person perception, and persuasion. Prerequisite: PGS 101.

General Studies: SB

PGS 351 Honors Social Psychology. (3)

not regularly offered

Critical analysis of human social behavior for honors students; topics include stereotyping, social influence, attraction, aggression, helping, groups, and attitudes. Open only to students without previous credit for PGS 350. Lecture, discussion. Prerequisites: PGS 101; honors standing; instructor approval.

General Studies: L/SB

PGS 365 Community Psychology. (3)

fall and spring

Mental health and psychological well-being in the community, emphasizing current issues and related research. Prerequisite: PGS 315 or 350.

General Studies: SB

PGS 394 Special Topics. (1–4)

not regularly offered

PGS 399 Supervised Research. (1–3)*fall, spring, summer*

Experience within the context of current faculty research projects. Student is assigned responsibility depending on qualifications. "Y" grade only. May be repeated for a total of 6 hours. Prerequisites: approval of faculty member before registration; "B" average in major. Pre- or corequisite: PSY 230 (or its equivalent).

PGS 414 History of Psychology. (3)*fall and spring*

Historical development of psychology from its philosophical beginnings to the present. Prerequisites: PGS 101; PSY 230, 290.

*General Studies: L/SB***PGS 427 Psychology of Aging. (3)***not regularly offered*

Analyzes loss, maintenance, and gain associated with cognitive and affective aging. Individual differences in coping with normative life transitions. Prerequisites: PGS 101, 341.

*General Studies: L/SB***PGS 430 Industrial Psychology. (3)***fall, spring, summer*

Organizations and management systems; motivation and work performance; human factors in systems design and evaluation; personnel selection and testing. Prerequisite: MGT 301 or PGS 101.

PGS 441 Cognitive Development. (3)*fall and spring*

Experimental and theoretical literature in child development and behavior. Prerequisite: PGS 341 or instructor approval.

*General Studies: L/SB***PGS 443 Abnormal Child Psychology. (3)***fall and spring*

Covers major disorders of childhood and adolescence (e.g., autism, hyperactivity, phobias, and delinquency), including cause, diagnosis, treatment, and prevention. Prerequisites: both PGS 101 and 315 (or 341 or 350) or only instructor approval.

*General Studies: L/SB***PGS 444 Adolescent Psychology and Psychopathology. (3)***not regularly offered*

Advanced-level survey of normal adolescent psychological development and psychological disorders of this age period. Lecture, discussion. Prerequisites: PGS 101, 341; PSY 290.

*General Studies: L***PGS 445 Child Language and Drawing. (3)***fall*

Language acquisition and developmental changes in drawing, considered in the context of cognitive developmental stages. Children's representation and communication of knowledge through language and drawing. Prerequisite: PGS 341.

*General Studies: SB***PGS 446 Social Development. (3)***not regularly offered*

Discusses theory, research, and issues regarding social development. Example topics: formation of attachments, prosocial development, and gender-role development. Lecture, seminar. Prerequisite: PGS 341.

*General Studies: L***PGS 450 Social Perception and Cognition. (3)***not regularly offered*

Critical analysis of human social perception and social cognition. Topics include attribution, inference, memory, attention, impression formation, stereotype change. Lecture, discussion. Prerequisites: PGS 101, 350.

*General Studies: L***PGS 451 Stereotyping, Prejudice, and Discrimination. (3)***not regularly offered*

Critical investigation of the processes underlying, and the factors contributing to, stereotyping, prejudice, and discrimination. Lecture, discussion. Prerequisites: PGS 101, 350.

*General Studies: L***PGS 452 Applied Social Psychology. (3)***fall*

Studies applications of social psychological theory and concepts in natural settings; research design and data analysis. Lecture, lab-type activities. Prerequisites: PGS 101, 350; PSY 230.

*General Studies: L***PGS 453 Organizational Behavior. (3)***not regularly offered*

Survey of psychological theory and research as applied to the behavior of individuals in organizational settings. Lecture, discussion. Prerequisites: PGS 101, 350.

PGS 458 Group Dynamics. (3)*fall*

Theories and methods of group leadership, group effectiveness, communication within groups, and relations between groups and individual members. Prerequisite: PGS 350.

PGS 461 Interpersonal Influence. (3)*not regularly offered*

Principles and procedures that affect the process of social influence; consideration of attitudinal, compliance-inducing, and perceptual influences. Prerequisite: PGS 350.

*General Studies: SB***PGS 462 Health Psychology. (3)***fall and spring*

Contributions of psychology to health promotion and illness prevention, adaptation to acute and chronic illness, and to the health care system. Prerequisites: PSY 230, 290.

PGS 463 Advanced Psychology of Adjustment. (3)*fall*

Critical analysis and effective expression of psychological theory and research of the topic of adjustment. Lecture, discussion, writing. Prerequisites: PSY 230, 290; completion of First-Year Composition requirement; General Studies L course.

*General Studies: L***PGS 464 Minority Issues in Psychology. (3)***spring*

Psychological issues relating to the diversity of human cultural experiences and among ethnic minorities in the U.S. Prerequisite: PSY 290.

PGS 465 Psychology of Stress and Coping. (3)*fall*

Readings in theory and research in the area of stress and coping. Lecture, discussion, class presentations. Prerequisites: PGS 315 (or 350); PSY 290.

*General Studies: L***PGS 466 Abnormal Psychology. (3)***fall, spring, summer*

Historical and current definitions, theory, and research concerning abnormal behavior. Major categories of psychopathology, including related treatment approaches. Prerequisites: PGS 101; PSY 290.

*General Studies: SB***PGS 467 Psychology of Magical Beliefs. (3)***not regularly offered*

Psychological nature and bases of magical beliefs and their impact on health behaviors, eating practices, and interpersonal relations. Lecture, seminar. Prerequisites: a combination of PGS 315 and 466 and PSY 434 or only instructor approval.

*General Studies: L***PGS 468 Psychology and Law. (3)***fall and spring*

Theories, research, and practice in psychology as related to law, including criminal, civil, domestic relations, and professional issues. Lecture, discussion. Prerequisite: PSY 290.

PGS 471 Psychological Testing. (3)*spring*

Methods and theory of psychological testing; various types of psychological tests; consideration of ethical, social, and legal aspects of testing. Prerequisite: PSY 290.

PGS 472 Clinical Psychology. (3)*fall and spring*

Clinical psychology as a science and profession. Historical development, methods of interviewing, assessment, and therapeutic intervention. Prerequisite: PGS 466.

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PGS 484 Internship. (1–12)*not regularly offered***PGS 494 Special Topics. (1–4)***not regularly offered***PGS 499 Individualized Instruction. (1–3)***not regularly offered***PSYCHOLOGY (PSY)**

For more PSY courses, see the "Faculty of Applied Psychology" under "East College" at "ASU East."

M PSY 230 Introduction to Statistics. (3)*fall, spring, summer*

Basic concepts in descriptive and inferential statistics, emphasizing applications to psychology. Self-paced (PSI) and lecture sections. Prerequisites: MAT 117; PGS 101.

*General Studies: CS***M PSY 290 Research Methods. (4)***fall and spring*

Planning, execution, analysis, and reporting of experiments. Literature, procedures, and instruments in representative areas of psychological research. 3 hours lecture, 3 hours lab. Prerequisites: ENG 101 (or 105); PSY 230.

*General Studies: L/SG***M PSY 320 Learning and Motivation. (3)***fall, spring, summer*

Principles of conditioning and motivation; approaches to learning, including acquisition of verbal materials, concepts, and motor skills; memory and transfer. Prerequisite: PSY 290.

M PSY 323 Sensation and Perception. (3)*fall and spring*

Underlying processes of vision, audition, and the other senses. Applies current research and theory in a laboratory environment. Prerequisite: PSY 290 or instructor approval.

M PSY 324 Memory and Cognition. (3)*fall, spring, summer*

Processes underlying information storage and retrieval, including different kinds of memory, forgetting, depth of processing, and control processes. Prerequisite: PSY 290.

M PSY 325 Physiological Psychology. (3)*fall, spring, summer*

Relationships of physiological processes to behavior. Emphasis on nervous system functioning. Prerequisites: PSY 290 (or 2 courses in biological science); instructor approval.

M PSY 330 Statistical Methods. (3)*spring*

Advanced application of statistics to psychology. Highly recommended for students interested in attending graduate school. 3 hours lecture, 1 hour lab. Prerequisite: PSY 230.

*General Studies: CS***M PSY 390 Experimental Psychology. (3)***spring*

Continuation of concepts in PSY 290, with emphasis on multifactor designs and programmatic sequence of experiments. Lecture, lab. Prerequisite: PSY 290.

*General Studies: L***M PSY 399 Supervised Research. (1–3)***fall, spring, summer***M PSY 420 Analysis of Behavior. (3)***not regularly offered*

Research, applications, and philosophy of the analysis and control of human behavior. Prerequisite: PSY 290.

*General Studies: L***M PSY 424 Genetic Psychology. (3)***spring*

Introduction to the concepts, methodologies, and findings of behavioral genetics for Psychology majors. Prerequisites: PGS 101; PSY 230, 290.

*General Studies: L***M PSY 425 Biological Bases of Behavior. (3)***not regularly offered*

Critical study of physiological psychology; brain mechanisms underlying motivation and learning. Prerequisite: PSY 325.

*General Studies: L***M PSY 426 Neuroanatomy. (4)***not regularly offered*

Structure and function of mammalian brain, including sheep brain dissection. 3 hours lecture, 3 hours lab. Prerequisite: PSY 325 (or its equivalent).

*General Studies: L***M PSY 434 Cognitive Psychology. (3)***spring*

Human organism as a processor of information, from perception to cognition. Abstract concepts, semantic memory, attention, and mental imagery. Prerequisite: PSY 323 or 324 or instructor approval.

*General Studies: L***M PSY 437 Human Factors. (3)***fall*

Emphasizes human factors in high-technology systems. Specific topics include systems development, systems analysis techniques, displays, and controls. Prerequisites: both PSY 290 and upper-division standing or only instructor approval.

*General Studies: L***M PSY 470 Psychopharmacology. (3)***fall and spring*

Basis of drug action at physiological and behavioral levels. Psychological and medical applications and limitations of drugs used in the treatment of mental illness. Prerequisites: PSY 325; 1 semester each of biology and chemistry.

M PSY 484 Internship. (1–12)*not regularly offered***M PSY 492 Honors Directed Study. (1–6)***not regularly offered***M PSY 493 Honors Thesis. (1–6)***not regularly offered***M PSY 494 Special Topics. (1–4)***not regularly offered***M PSY 497 Honors Colloquium. (1–6)***not regularly offered***M PSY 498 Pro-Seminar. (1–7)***fall and spring*

Possible topics:

- (a) Behavioral Neuroscience Research. (3)

*General Studies: L***M PSY 499 Individualized Instruction. (1–3)***not regularly offered***M PSY 501 Supervised Teaching. (4)***fall*

Experience in and examination of perspectives on teaching undergraduate psychology. Prerequisites: graduate standing in psychology; instructor approval.

M PSY 506 Survey of Research in Environmental Psychology. (3)*fall*

Major topics and paradigms in the study of person-environment relationships. Prerequisite: instructor approval.

M PSY 512 Advanced Learning. (3)*not regularly offered*

Principles and theories of learning, emphasizing research literature. Prerequisite: instructor approval.

M PSY 524 Advanced Physiological Psychology. (3)*not regularly offered*

Contributions of physiological processes and brain function to fundamental behavioral processes. Prerequisite: instructor approval.

M PSY 528 Sensation and Perception. (3)*not regularly offered*

Principles of sensory and perceptual processes, emphasizing research literature. Prerequisite: instructor approval.

M PSY 530 Analysis of Variance in Psychological Research. (3)*fall*

One-way and factorial designs, contrasts, post-hoc tests, probing of interactions, mixed designs, power, computer applications. Prerequisite: undergraduate statistics or instructor approval.

M PSY 531 Multiple Regression in Psychological Research. (3)*spring*

Multiple regression and correlation, hierarchical regression, interactions, curvilinear relationships, categorical predictors, ANOVA in regression, regression diagnostics, regression graphics. Prerequisite: PSY 530 or instructor approval.

M PSY 532 Analysis of Multivariate Data. (3)*fall*

Matrix algebra for multivariate procedures, component and factor analysis, canonical and discriminant analysis, classification, MANOVA, logistic regression, hierarchical linear model. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 533 Structural Equation Modeling. (3)*spring*

Path analysis; exploratory and confirmatory factor analysis; recursive and nonrecursive latent variable models; mean and covariance structures; latent growth models. Prerequisite: PSY 532 or instructor approval.

M PSY 534 Psychometric Methods. (3)*fall and spring*

Theory and practice of psychological measurement using classical and modern test theories. Reliability assessment, test validation, test construction, test usage. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 535 Cognitive Processes. (3)*not regularly offered*

Theoretical/empirical treatment of the human organism as a processor of information, including abstraction, memory structure, problem solving, and thinking. Prerequisite: instructor approval.

M PSY 536 Statistical Methods in Prevention Research. (3)*fall and spring*

Statistical methods used in prevention research including epidemiological methods, logistic regression, program effect estimation, estimation, and mediation analysis. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 537 Longitudinal Growth Modeling. (3)*not regularly offered*

Growth modeling methodology to describe individual variation in development over time. Employs multilevel and structural equation modeling frameworks. Prerequisite: PSY 533 or instructor approval.

M PSY 538 Advanced Structural Equation Modeling. (3)*not regularly offered*

Mean and covariance structure analysis. Includes multiple-group modeling, two-level hierarchical modeling, longitudinal growth modeling, analysis with categorical outcomes. Prerequisite: PSY 533 or instructor approval.

M PSY 539 Meta-Analysis I. (1)*fall*

Meta-analysis; searching the literature, coding study characteristics, computing effect sizes. Must be followed by PSY 540. Seminar. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 540 Meta-Analysis II. (2)*spring*

Continuation of PSY 539. Meta-analysis; computing effect sizes, and analyzing the heterogeneity of effect sizes. Seminar. Prerequisite: PSY 539.

M PSY 541 Research in Cognitive Development. (3)*not regularly offered*

Theoretical and empirical issues in the study of children's knowledge and cognitive processes. Comparison of research in Piagetian and other traditions. Prerequisite: admission to Psychology Ph.D. program or instructor approval.

M PSY 542 Social Development. (3)*not regularly offered*

Reviews and critiques major issues in the area of social development. Covers theory, research, and content. Prerequisite: instructor approval.

M PSY 550 Advanced Social Psychology. (3)*fall and spring*

Theory and research concerning interpersonal perception, decision making, attitude formation and change, group processes, social motivation, and interaction processes. Prerequisite: instructor approval.

M PSY 551 Advanced Social Psychology. (3)*fall and spring*

Continuation of PSY 550. Prerequisite: PSY 550 or instructor approval.

M PSY 553 Social Influence. (3)*not regularly offered*

Researches literature relevant to attitude formation and change, conformity, obedience, power, compliance, altruism, and others. Prerequisite: PSY 551 or instructor approval.

M PSY 555 Experimental and Quasi-Experimental Designs for Research. (3)*not regularly offered*

Reviews research techniques. Analyzes laboratory and field research; applications to specific topics. Prerequisite: instructor approval.

M PSY 569 Advanced Study of Personality. (3)*not regularly offered*

Personality as a theoretical concept in psychology, including definitional problems, behavioral and traditional approaches, the measurement of personality, and current research issues. Prerequisite: instructor approval.

M PSY 572 Psychological Assessment. (3)*fall*

Theory and research on assessment of personality, psychopathology, and intelligence; construction of psychological assessment instruments. Prerequisite: admission to clinical Ph.D. program or instructor approval.

M PSY 573 Psychopathology. (3)*fall*

Theory and research relating to the contribution of psychological, social, physiological, and genetic factors to the development and persistence of abnormal behavior. Prerequisite: admission to Psychology Ph.D. program or instructor approval.

M PSY 574 Psychotherapy. (3)*spring*

Detailed survey of the theoretical and empirical literature relating to verbal psychotherapy and interviewing methods. Structured role-playing practice in the major procedures. Prerequisite: admission to the clinical Ph.D. program or instructor approval.

M PSY 578 Child Psychopathology. (3)*not regularly offered*

Major theories and research related to the development of deviant behaviors in children, including some supervised experience in child assessment. Prerequisite: PSY 572 or instructor approval.

M PSY 582 Community Psychology. (3)*summer*

Community systems, intervention techniques, consultation models, history and current status of community mental health movement, and conceptualization of the roles of community psychologists in social system intervention. Prerequisite: advanced standing in Psychology Ph.D. program or instructor approval.

M PSY 588 Consultation Methods. (3)*not regularly offered*

Several theories and strategies of organizational consultation. Develops consultative skills through simulation and practical experience. Prerequisite: advanced standing in Psychology Ph.D. program or instructor approval.

M PSY 624 Clinical Neuroscience. (3)*spring*

Examines the biological underpinnings of psychological disorders at the molecular, cellular, and system levels (schizophrenia, depression, anxiety, etc.). Lecture, pro-seminar. Prerequisites: graduate standing; instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Department of Religious Studies

Joel Gereboff
Chair

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www.asu.edu/clas/religious_studies

PROFESSORS

CADY, COUDERT, FELDHAUS, FOARD

ASSOCIATE PROFESSORS

CLAY, FESSENDEN, GEREBOFF, MOORE, MORRISON,
SCHOBER, SWANSON, WOODWARD

ASSISTANT PROFESSORS

DAMREL, LEON, UMAR

RELIGIOUS STUDIES—B.A.

The B.A. degree in Religious Studies consists of 45 semester hours, 30 of which must be in religious studies (including 21 in upper-division courses) and 15 of which must be in related fields. In order for the student to become acquainted with the character and role of religions across a wide spectrum of social and historical contexts, the 30 semester hours in religious studies must include the following courses:

1. REL 305 Ritual, Symbol, and Myth;
2. at least one course from each of the following distribution areas: Religion in the Americas, Religion and Asian Cultures, and Religion and Western Cultures; and
3. two research seminars, including REL 405 Problems in Religious Studies, which may be repeated for credit; or
4. in place of a second seminar, a student may take REL 499 to write an undergraduate thesis.

The Religious Studies major is an appropriate choice for students wishing to explore such areas as African or African American studies; Islamic studies; myth, ritual, and the arts; Native American studies; and religion and politics. All majors must plan their programs in consultation with a departmental advisor. A minimum GPA of 2.50 is required in the 30 semester hours of religious studies courses.

MINOR IN RELIGIOUS STUDIES

The minor in Religious Studies consists of 18 semester hours, at least 12 of which must be in the upper division. Both REL 305 and 405 are required. For minor verification, students must consult a department advisor.

CERTIFICATES AND EMPHASES

The following are certificate programs or emphases offered in the Department of Religious Studies. For more information on each, see “Certificate Programs and Areas of Emphasis,” page 324, or access the department Web site at www.asu.edu/clas/religious_studies.

Asian Studies Certificate. Students majoring in Religious Studies may elect to pursue an Asian Studies emphasis or East Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content.

Jewish Studies Certificate. Students majoring in Religious Studies may elect to pursue a Jewish Studies Certificate combining courses from the major with selected outside courses in the area of Jewish Studies.

Latin American Studies Certificate. Students majoring in Religious Studies may elect to pursue a Latin American Studies certificate combining courses from the major with selected outside courses of wholly Latin American content.

Russian and East European Studies. Students majoring in Religious Studies may elect to earn a Russian and East European Studies Certificate by successfully completing one of the options mentioned in “Russian and East European Studies,” page 326.

Southeast Asian Studies Emphasis. Students majoring in Religious Studies may elect to earn a Southeast Asian Studies Certificate by successfully completing the requirements.

Women’s Studies. Students majoring in Religious Studies may elect to earn a Women’s Studies Certificate by successfully completing the requirements.

GRADUATE PROGRAM

The faculty in the Department of Religious Studies offer a graduate program leading to the M.A. degree for those who wish to enter a doctoral program in the study of religions, for those who wish to teach at the community college level, and for those in nonacademic careers who desire general competence in the academic study of religions. See the *Graduate Catalog* for requirements.

RELIGIOUS STUDIES (REL)

REL 100 Religions of the World. (3)

fall and spring

Introduction to the history of religious traditions of the world, including Buddhism, Christianity, Hinduism, Islam, Judaism, and others. Credit is allowed for only REL 100 or 200.

General Studies: HU, G

REL 200 The Study of Religious Traditions. (3)

not regularly offered

Writing-intensive course introducing analytical skills necessary for understanding religious traditions. Beliefs, practices, and communities of several religious traditions of the world. Credit is allowed for only REL 200 or 100. Prerequisite: ENG 101 (or 105).

General Studies: L/HU, G

REL 201 Religion and the Modern World. (3)*once a year*

Introduction to the nature and role of religious beliefs and practices in shaping the lives of individuals and societies, with particular attention to the modern world. Prerequisite: ENG 101 (or 105).

*General Studies: L/HU***REL 202 Religion and Popular Culture. (3)***once a year*

Explores various intersectors between religion and the popular media, including music, news, advertising, the visual arts, literature, performance, and film. Lecture, discussion.

*General Studies: HU, C***REL 203 Saints and Sinners: Explorations in Sacred Biography. (3)***not regularly offered*

Comparison of the role of biography across religions to examine the process of categorizing people as saints or sinners. Lecture, discussion.

*General Studies: HU, H***REL 205 Living and Dying. (3)***not regularly offered*

Ways that religions have understood birth, sexuality, death and the passing of generations. Examples from traditions throughout the world. Lecture, discussion.

*General Studies: HU***REL 210 Introduction to Judaism. (3)***once a year*

Beliefs, ceremonies, festivals, and institutions of Judaism emphasizing the contemporary era. Assumes no previous knowledge about Judaism. Prerequisite: ENG 101 (or 105).

*General Studies: L/HU, H***REL 225 African American Religion. (3)***not regularly offered*

Introduction to the history and development of the African American religious tradition. Lecture, discussion. Cross-listed as AFH 225. Credit is allowed for only AFH 225 or REL 225.

*General Studies: HU, C***REL 240 Introduction to Southeast Asia. (3)***fall*

Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/GCU 240/HST 240/POS 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.

*General Studies: G***REL 260 Introduction to Islam. (3)***spring*

Examines Islamic beliefs, ceremonies, festivals, and institutions. Assumes no prior knowledge about Islam. Lecture, discussion. Cross-listed as HUM 260. Credit is allowed for only HUM 260 or REL 260.

*General Studies: HU, G***REL 270 Introduction to Christianity. (3)***once a year*

Beliefs, ceremonies, festivals, and institutions of Christianity, emphasizing the contemporary era. Assumes no previous knowledge about Christianity.

*General Studies: HU***REL 301 Comparative Mysticism. (3)***once a year*

Comparative examination of Eastern and Western mystical traditions from antiquity to the present. Lecture, discussion. Prerequisite: REL 100.

*General Studies: HU***REL 305 Ritual, Symbol, and Myth. (3)***fall and spring*

Ritual, symbol, and myth as types of religious expression, with examples selected from the nonliterate religions of the world.

*General Studies: L/HU***REL 310 Western Religious Traditions. (3)***fall and spring*

Religious traditions of Judaism, Christianity, and Islam, comparing their doctrinal, institutional, and ritual systems and social histories. Lecture, discussion.

*General Studies: HU, H***REL 315 Hebrew Bible (Old Testament). (3)***once a year*

Nature, content, background, historical situation, and message of the books of the Hebrew Bible in English translation.

*General Studies: L/HU, H***REL 317 Introduction to Rabbinic Judaism. (3)***not regularly offered*

Historical analysis of the thought, literature, and institutions of rabbinic Judaism.

*General Studies: HU, H***REL 318 Contemporary American Jewish Identities. (3)***spring*

Analyzes the complexity and diversity of the contemporary American Jewish community in religious and secular affairs. Lecture, discussion. Cross-listed as SOC 370. Credit is allowed for only REL 318 or SOC 370.

REL 320 American Religious Traditions. (3)*fall and spring*

Examines the formation, development, and interaction of major American religious traditions (indigenous, African American, Asian American, and Euro-American).

*General Studies: HU, C, H***REL 321 Religion in America. (3)***fall and spring*

History of religion in America with attention to issues of historiography, pluralism, gender, race, ethnicity, politics, and social reform.

*General Studies: HU, C, H***REL 322 Malcolm and Martin. (3)***not regularly offered*

Examines and contrasts the lives, ministries, contributions, and legacies of Malcolm X and Martin Luther King, Jr. Cross-listed as AFH 322. Credit is allowed for only AFH 322 or REL 322.

*General Studies: HU, C***REL 323 Black Religion: A Biographical Approach. (3)***not regularly offered*

Examines the experiences, motivations, and contributions of a number of figures associated with African American religion. Cross-listed as AFH 323. Credit is allowed for only AFH 323 or REL 323.

*General Studies: HU, C***REL 324 Spirituals and the Blues. (3)***spring*

Multidisciplinary exploration of the African American religious and musical response to the North American diaspora experience. Lecture, discussion.

REL 330 Native American Religious Traditions. (3)*once a year*

Presents world views and religious thought through the art, architecture, literature, music, mythology, ritual, and folklore of representative tribes in North America.

*General Studies: HU, C***REL 331 History of Native American Religious Traditions. (3)***once a year*

Role of religion in Native American history, including missionization, and religious adaptation; prophetic, messianic, and religious revitalization movements.

*General Studies: L/HU, C, H***REL 332 South American Indian Religions. (3)***not regularly offered*

Introduction to the sacred stories, ceremonies, and beliefs of Native South American peoples in their historical contexts.

General Studies: HU, G

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

REL 344 Religion and Values in Japanese Life. (3)*once a year*

Japanese values expressed in the life and annual cycles of the family, local and national identities, and popular culture. Lecture, discussion.

*General Studies: HU, G***REL 345 Asian Religious Traditions. (3)***once a year*

Introduction to the major concepts of religious beliefs, rituals, and practices in Hinduism and Buddhism. Lecture, discussion.

*General Studies: HU, G***REL 350 Hinduism. (3)***once a year*

Studies diverse forms of Hinduism through its institutions, literature, folklore, art, and architecture.

*General Studies: L/HU, G, H***REL 351 Buddhism. (3)***once a year*

Doctrines, practices, and institutions of the Buddhist religion, emphasizing its role in the history and culture of Asian societies.

*General Studies: L/HU, G***REL 355 Japanese Cities and Cultures to 1800. (3)***once a year*

Relations among ideas and literary, visual, and performing arts of the ancient aristocracy, medieval samurai, and early modern townspeople. Cross-listed as HUM 310. Credit is allowed for only HUM 310 or REL 355.

*General Studies: L/HU, H***REL 365 Islamic Civilization. (3)***fall*

Global historical survey of Islamic cultures and societies up to the modern period. Lecture, discussion.

*General Studies: HU, H***REL 366 Islam in the Modern World. (3)***spring*

Examines the worldwide transformations of Islamic religion, cultures, and societies in the modern period. Lecture, discussion.

*General Studies: HU, G, H***REL 371 New Testament. (3)***once a year*

Origins and literature of early Christian communities; historical investigations of the types of oral and written tradition in the New Testament.

*General Studies: HU***REL 372 Formation of the Christian Tradition. (3)***once a year*

Origins, development, and expansion of Christianity; major themes and tensions from the New Testament world to the beginning of the Middle Ages.

*General Studies: HU, H***REL 373 Women in Judaism. (3)***spring*

Studies the legal, social, and cultural status of Jewish women in various historical and contemporary societies. Cross-listed as WST 372. Credit is allowed for only REL 373 or WST 372.

REL 374 Witchcraft and Heresy in Europe. (3)*not regularly offered*

Background, origins, and development of the Inquisition; persecution of women and marginal groups. Cross-listed as HST 361. Credit is allowed for only HST 361 or REL 374. Prerequisite: upper-division standing or instructor approval.

*General Studies: L, H***REL 377 Religion in Russia. (3)***not regularly offered*

Examines the history of the various religious traditions of Russia and the former USSR from an interdisciplinary perspective.

*General Studies: HU, H***REL 379 Religion, Nationalism, and Ethnic Conflict. (3)***not regularly offered*

Examines the role of religion in national and ethnic conflict in the contemporary world.

*General Studies: HU, G***REL 381 Religion and Moral Issues. (3)***once a year*

Manner in which human religiousness relates to social concerns, e.g., sexuality, the environment, bioethical issues, and violence.

*General Studies: L/HU***REL 382 Religion, Magic, and Science. (3)***once a year*

Relationship and conflict between religion, magic, and science in the West from antiquity to the present. Lecture, discussion.

*General Studies: L/HU***REL 383 Origins, Evolution, and Creation. (3)***not regularly offered*

Examines scientific, mythic, and religious ideas relating to origins (particularly human). Place of antievolutionism and "scientific creationism" in American culture. Lecture, discussion. Cross-listed as BIO 344/HPS 311/HUM 371. Credit is allowed for only BIO 344 or HPS 311 or HUM 371 or REL 383.

REL 385 Contemporary Western Religious Thought. (3)*not regularly offered*

Introduction to contemporary Jewish and Christian thought. Topics include religion and politics, problem of evil, interpretations of God, and feminist theology.

*General Studies: L/HU***REL 386 America and the Holocaust. (3)***fall*

Analyzes the historical and sociopolitical factors that shaped U.S. policy decisions regarding Germany's assault on Europe's Jews.

REL 390 Women and Religion. (3)*fall and spring*

Role of women in several organized religions and/or religious sects, including a study of myth and symbols as they are used to establish, maintain, and enforce sex-roles within specific religions.

*General Studies: HU, G***REL 405 Problems in Religious Studies. (3)***fall and spring*

Selected topics in religious studies; involves students in research interests of instructor. May be repeated for credit when topics vary. Seminar. Prerequisite: at least 9 semester hours of REL courses or instructor approval.

REL 410 Judaism in Modern Times. (3)*not regularly offered*

Variety of expressions of Judaism and Jewishness in the modern period. Topics may include American Judaism or religious responses to the Holocaust.

*General Studies: HU, H***REL 415 The Jewish Mystical Tradition. (3)***not regularly offered*

Examines some of the esoteric lore of Judaism. Studies movements and literature such as Hasidism and Kabbalah.

*General Studies: HU***REL 420 Religion in American Life and Thought. (3)***not regularly offered*

Influence of religion on American society, culture, and ideas; the distinctive character of religion in America. Prerequisite: REL 320 or 321 (or its equivalent).

*General Studies: L/HU***REL 426 American Preachers and Preaching: The Sermon in America. (3)***not regularly offered*

Life and work of notable American preachers. Emergence of the preacher as representative of American religion. Prerequisite: REL 320 or 321 (or its equivalent).

*General Studies: L/HU***REL 427 American Religious Thought. (3)***not regularly offered*

Thought of representative American religious thinkers, i.e., Jonathan Edwards, William Ellery Channing, Horace Bushnell, and Reinhold Niebuhr. Prerequisite: REL 320 or 321 (or its equivalent).

*General Studies: HU, H***REL 444 Religion in Japan. (3)***once a year*

Religion in Japanese history, especially the development of Japanese Buddhism, and religion in the modern transformation of Japan. Prerequisite: instructor approval.

General Studies: HU, G, H

REL 460 Studies in Islamic Religion. (3)*not regularly offered*

Issues in the interpretation and understanding of Islamic texts, history, society, culture, and rituals. Prerequisites: both REL 365 and Religious Studies major or only instructor approval.

*General Studies: HU, G***REL 470 Religion in the Middle Ages. (3)***not regularly offered*

Religious aspects of medieval life and thought; variety of forms of dissent, heresy, and reform movements from the 4th to 13th centuries.

*General Studies: HU, H***REL 471 Reformation and Modern Christianity. (3)***not regularly offered*

Protestant Reformation to contemporary Christian movements; includes factors in the dissolution of the Medieval Christian synthesis, variety of reform movements and reformation patterns, Catholic counter-reform measures, formation of liberal theology, ecumenical movement, and the World Council of Churches.

*General Studies: HU, H***REL 480 Religion and Global Politics. (3)***once a year*

Explores the nature and role of religion in international politics in the modern period. Lecture, discussion.

*General Studies: G***REL 483 Religion and Science. (3)***spring*

Investigates the correlation between science and religion as an interdisciplinary study from a historical perspective. Readings, film, lecture, discussion. Prerequisite: junior standing or instructor approval.

REL 486 Modern Critics of Religion. (3)*not regularly offered*

Major theories and critiques of religion among modern social, philosophical, and religious thinkers.

*General Studies: HU***REL 494 Special Topics in Religious Studies. (3)***fall and spring*

Open to all students, freshmen by instructor approval only. Topics may be selected from various areas.

REL 498 PS: Pro-Seminar in Religious Studies. (3)*not regularly offered*

For students with a major or minor emphasis in Religious Studies.

REL 499 Individualized Instruction. (1–3)*fall and spring***REL 501 Research Methods in Religious Studies. (3)***fall*

Explores the major themes and methods in the study of religion, with primary focus on classical texts. Lecture, discussion.

REL 502 Research Methods in Religious Studies. (3)*spring*

Explores the major themes and methods in the study of religion, with primary focus on contemporary texts. Lecture, discussion.

REL 591 Seminar. (3)*fall and spring*

Topics on methodological issues in the study of religion. Prerequisite: Religious Studies graduate student or instructor approval.

REL 592 Research. (1–12)*fall and spring***REL 598 Special Topics. (1–4)***fall and spring*

May be repeated for credit. Possible topics:

- (a) Christianity. (3)
- (b) Islam. (3)
- (c) Judaism. (3)
- (d) Native American Religion. (3)
- (e) Problems in Religious Studies. (3)
- (f) Religion in America. (3)
- (g) Religion in East Asia. (3)
- (h) Religion in South and Southeast Asia. (3)
- (i) Study of Religion, Comparative Religion. (3)
- (j) Western Religious Thought, Ethics. (3)

Department of Sociology

Verna M. Keith

Chair

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www.asu.edu/clas/sociology

PROFESSORS

BOLIN, COBAS, GORDON, HACKETT, KRONENFELD,
KULIS, LANER, NAGASAWA, THOMAS, WEITZ

ASSOCIATE PROFESSORS

BENIN, BLAIR, HARLAN, JACOBSON, KEITH,
MILLER-LOESSI, QIAN, SULLIVAN

ASSISTANT PROFESSORS

AGADJANIAN, GLICK, PADILLA

SENIOR LECTURER

FINE

SOCIOLOGY—B.A.

The B.A. degree in Sociology requires a minimum of 30 semester hours of Sociology course work and 15 hours in closely related fields. Of the 30 required hours, a minimum of 18 hours must be upper-division with at least 12 of the 18 upper-division hours taken in residence at ASU Main Campus. All upper-division courses in the major must be completed with a grade of “C” or higher. The following courses are required:

SOC 101	Introductory Sociology <i>SB</i>	3
	or SOC 301 Principles of Sociology <i>SB</i> (3)	
SOC 390	Social Statistics I <i>CS</i>	3
SOC 391	Sociological Research <i>SB</i>	3
SOC 483	History of Social Thought <i>L/SB</i>	3
	or SOC 485 Sociology of Knowledge <i>L/SB</i> (3)	
	or SOC 486 Contemporary Theory <i>SB</i> (3)	
Total	.....	12

Sociology majors may complete the remaining 18 required hours through selecting one of two options. For a general sociology degree, students must choose six courses that sample at least three of the seven sociology content areas:

1. family;
2. intergroup relations and social psychology;
3. political/comparative-historical;
4. social problems and processes;
5. stratification/occupations/organization;
6. urban sociology/demography; or
7. race and ethnicity.

If majors desire a more focused preparation in a specialized area, they may complete the remaining 18 hours in one of five focus areas: family issues, urban issues, diversity issues, work/organizational issues, and health issues. Students choosing this option must complete two required

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focus area courses and select the remaining four courses from a list of optional courses within that focus area. SOC 484 Internships are available within the focus area option for those who qualify.

Information concerning the two options for fulfilling major requirements is available in the Department of Sociology office in SS 321, and on the Internet at www.asu.edu/clas/sociology/undergraduate/advising.

MINOR IN SOCIOLOGY

The minor in Sociology requires 18 hours, of which 12 hours must be upper-division courses, with at least six upper-division hours completed at ASU Main Campus. The required courses are as follows:

SOC 101	Introductory Sociology <i>SB</i>	3
	or SOC 301 Principles of Sociology <i>SB</i> (3)	
SOC 391	Sociological Research <i>SB</i>	3
	or SOC 483 History of Social Thought <i>L/SB</i> (3)	
	or SOC 485 Sociology of Knowledge <i>L/SB</i> (3)	
	or SOC 486 Contemporary Theory <i>SB</i> (3)	
Total	.....	6

The remaining four courses consist of sociology electives.



Marilyn Bloom, research specialist in microbiology, displays her collection of insects.

Tim Trumble photo

SECONDARY EDUCATION—B.A.E.

Social Studies. The major teaching field of social studies education consists of 63 semester hours, of which 30 hours may be in criminal justice, economics, geography, history, political science, psychology, and sociology and are exactly those courses required for the B.A. degree in Sociology. Of the remaining hours, two groups of 12 hours each and one of six hours are generally taken in related social sciences plus SED 480 Special Methods of Teaching Social Studies.

The minor teaching field consists of 24 semester hours, at least six of which must be upper division. SOC 101 Introductory Sociology or SOC 301 Principles of Sociology, and SOC 470 Racial and Ethnic Relations or SOC 474 African-Americans in Modern Society are required. The remaining 18 hours must be approved by the sociology advisor in consultation with the student and must include at least one course from at least four of the following six areas:

1. family;
2. intergroup relations and social psychology;
3. political/comparative-historical;
4. social problems and processes;
5. stratification/occupations/organization; or
6. urban sociology/demography.

GRADUATE PROGRAMS

The faculty in the Department of Sociology offer programs leading to the M.A. and Ph.D. degrees. See the *Graduate Catalog* for requirements.

SOCIOLOGY (SOC)

SOC 101 Introductory Sociology. (3)

fall, spring, summer

Fundamentals of sociology, organization of human groups and society, processes of interaction, and social change. Credit is allowed for only SOC 101 or 301. 2 hours lecture, 1 hour discussion.

General Studies: SB

SOC 301 Principles of Sociology. (3)

fall, spring, summer

Intensive and critical analysis of the concepts of sociology. Credit is allowed for only SOC 301 or 101.

General Studies: SB

SOC 312 Sociology of Adolescence. (3)

fall, spring, summer

Cultural values and the social processes that help explain the development of the phenomenon of modern adolescence, including investigation of adolescent subcultures and cross-cultural references.

Prerequisite: SOC 101 or 301 or instructor approval.

General Studies: SB

SOC 315 Courtship and Marriage. (3)

fall, spring, summer

Overview of courtship, marriage, and related processes, focusing on problematic aspects of these institutions from the sociological perspective. Prerequisite: SOC 101 or 301 or instructor approval.

General Studies: SB

SOC 318 Overview of Aging. (3)

summer

Multidisciplinary introduction to gerontology. Explores the characteristics, experiences, needs, and problems of older persons. Prerequisite: SOC 101 or 301 or instructor approval.

General Studies: SB

SOC 321 Sociology of Work. (3)

fall and spring

Social and cultural analysis of industry. Occupational roles, status, and social participation of workers. Prerequisite: SOC 101 or 301 or instructor approval.

General Studies: SB

SOC 331 Environmental Sociology. (3)*fall and spring*

Analyzes human organizational responses to population growth, technological change, and environmental stressors on both a national and global scale. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB, G***SOC 332 Urban Sociology. (3)***fall and spring*

Growth, characteristics, and problems of the modern city. Prerequisite: SOC 101 or 301.

*General Studies: SB, G***SOC 333 Population. (3)***fall and spring*

Theories of population change; births, deaths, and migration; population policies. Prerequisite: SOC 101 or 301.

*General Studies: SB, G***SOC 334 Technology and Society. (3)***fall*

Development of technology in relation to society, work, science, the environment, public health, and cultural values related to social change. Lecture, discussion. Prerequisite: SOC 101 or 301 or instructor approval.

SOC 340 The Sociology of Deviance. (3)*fall, spring, summer*

Sociological analysis of stigmatized behaviors and conditions, including the causes, effects, and management of stigma. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 341 Modern Social Problems. (3)***fall, spring, summer*

Race relations, poverty, unemployment, and other current issues. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 352 Social Change. (3)***not regularly offered*

Patterns of social change, resistance to change, and change-producing agencies and processes. Prerequisite: SOC 101 or 301.

*General Studies: SB, G, H***SOC 360 Sociological Psychology. (3)***fall and spring*

Interaction patterns between the sociocultural order and individuals; socialization process; norms, roles, and statuses; collective behavior. Prerequisite: SOC 101 or 301.

*General Studies: SB***SOC 361 Variant Sexuality. (3)***fall*

Sociological research and theories dealing with homosexuality, transvestism, transsexualism, and other variations in sexual orientation and gender identity. Prerequisite: SOC 101 or 301.

*General Studies: SB***SOC 363 Men and Masculinity. (3)***not regularly offered*

Sociological analysis of how masculine identity is defined, negotiated, and variously constructed depending upon class, ethnicity, age, and sexual orientation. Prerequisites: SOC 301; WST 100 (or 300).

*General Studies: SB***SOC 365 The Sociology of Mass Communication. (3)***fall and spring*

Sociological exploration of the major mass media as a communicative process in American society. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 368 Sociology of Everyday Life. (3)***not regularly offered*

Examines routine everyday behavior as it relates to problems of social order, control, change, identity, and relationships. Prerequisite: SOC 101 or 301 or instructor approval.

SOC 370 Contemporary American Jewish Identities. (3)*spring*

Analyzes the complexity and diversity of the contemporary American Jewish community in religious and secular affairs. Lecture, discussion. Cross-listed as REL 318. Credit is allowed for only REL 318 or SOC 370.

SOC 390 Social Statistics I. (3)*fall, spring, summer*

Descriptive and inferential statistical methods for analysis of social data. Computer applications. Prerequisites: SOC 101 (or 301); General Studies MA course.

*General Studies: CS***SOC 391 Sociological Research. (3)***fall, spring, summer*

Methods of sociological research, including the fundamental assumptions underlying research and some practical experience in research design, data collection techniques, and data analysis. Prerequisite: SOC 101 or 301 or 390 or instructor approval.

*General Studies: SB***SOC 415 The Family. (3)***fall, spring, summer*

Family considered from the institutional viewpoint; its historical development and its adaptation to a changing culture; the family system in many cultures. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 416 Marriage Problems in Contemporary Society. (3)***spring*

Marital and family problems in today's society from the viewpoint of personal and cultural adjustment. Prerequisites: both SOC 101 (or 301) and an additional 3 hours in sociology or only instructor approval.

*General Studies: L/SB***SOC 417 Family Violence. (3)***fall and spring*

Current research and theories about domestic violence including child maltreatment, spousal aggression, and courtship violence. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 418 Aging and the Life Course. (3)***fall and spring*

Social aspects of aging. Theoretical and methodological perspectives and problems of aging such as life satisfaction, retirement, and adjustment to role loss. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 420 Sociology of Religion. (3)***not regularly offered*

Interrelationship of culture, society, and religion; religion and social stratification; religious, economic, and political institutions; social change and religion. Emphasis on American society and institutions. Prerequisites: both ASB 102 (or SOC 101 or 301) and an additional 3 hours in sociology or only instructor approval.

*General Studies: L/SB***SOC 421 Education and Society. (3)***fall*

Uses contemporary sociological perspectives to examine effects of schools and schooling on individuals and society. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 422 Sociology of Complex Organizations. (3)***spring*

Sociological studies of government agencies, industrial firms, labor unions, military establishments, and other large-scale organizations. Prerequisite: 6 hours in sociology (including SOC 101 or 301) or instructor approval.

*General Studies: L/SB***SOC 423 Social Class and Stratification. (3)***spring*

Classical and contemporary theories about who gets what and why. Examines social and economic inequalities by class, gender, and race/ethnicity. Lecture, discussion. Prerequisites: both SOC 101 (or 301) and an additional 3 hours in sociology or only instructor approval.

General Studies: L/SB

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SOC 424 Women and Health. (3)*spring in odd years*

Women as health care workers and issues of health, illness, and health care for women. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: L/SB***SOC 427 Sociology of Health and Illness. (3)***fall and spring*

Social aspects of physical and mental illness and sociological analysis of the health care system and its practitioners. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: L/SB***SOC 429 Sociology of Law. (3)***not regularly offered*

Examines law as an institution; its origins, operations, and consequences. Emphasis on contemporary legal issues and problems. Prerequisite: SOC 101 or 301.

*General Studies: SB***SOC 433 Demographic Methods. (3)***spring*

Science of population analysis; problems in measurements of size, composition, and changes in population. Prerequisite: SOC 101 or 301.

*General Studies: SB***SOC 446 Sociology of Crime. (3)***not regularly offered*

Process of criminalization, exploring the behavior of the definers of crime, and the behavior of those defined as criminals. Prerequisites: both SOC 101 (or 301) and 340 or only instructor approval.

*General Studies: SB***SOC 448 Epidemics and Society. (3)***fall*

Provides a perspective on how epidemics occur, are perceived in society, and affect it. Prerequisite: SOC 101 or 301 or instructor approval.

SOC 451 Comparative Sociology. (3)*not regularly offered*

Cross-cultural study of basic social institutions; the methodology of cross-cultural research. Prerequisite: ASB 102 or SOC 101 (or 301) or instructor approval.

*General Studies: SB, G***SOC 455 Social Movements. (3)***not regularly offered*

Surveys theoretical approaches and research on historical and recent social movements. Emphasis on cultural, political, and social change. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 456 Political Sociology. (3)***not regularly offered*

Social factors associated with voting; nature and structure of the electorate and political parties and the nature of national and international power structure. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB, G***SOC 464 Women's Roles. (3)***spring*

Sociological analysis of the development, nature, and consequences of traditional and alternative roles of women in contemporary society. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: L/SB, C***SOC 470 Racial and Ethnic Relations. (3)***fall, spring, summer*

Problems of minorities in the United States and in other racially and ethnically heterogeneous societies. Evaluates theories of prejudice and of research dealing with discrimination, desegregation, and assimilation. Lecture, discussion. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB, C***SOC 474 African Americans in Modern Society. (3)***spring*

Social and cultural heritage of black Americans; achievements and current trends. Lecture, discussion. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: L/SB, C***SOC 483 History of Social Thought. (3)***fall, spring, summer*

Social thought in human culture. Background of modern sociology. Prerequisite: SOC 101 or 301.

*General Studies: L/SB***SOC 484 Internship. (1–12)***fall and spring*

See Department of Sociology advisor.

SOC 485 Sociology of Knowledge. (3)*not regularly offered*

Relationship between social conditions and the development of knowledge in modern society. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: L/SB***SOC 486 Contemporary Theory. (3)***not regularly offered*

Contemporary issues and crises in social theory with major focus on particular theorists. Ideological factors in theory, philosophical issues, the nature of theory and its relationship with methodology. Prerequisite: SOC 101 or 301 or instructor approval.

*General Studies: SB***SOC 500 Research Methods. (1–12)***not regularly offered***SOC 501 Practicum in Survey Research. (3)***fall and spring*

Research practicum in survey field work, analysis, and reporting in the Phoenix Area Study. Prerequisite: SOC 391 (or its equivalent).

SOC 502 Practicum in Survey Research. (3)*fall and spring*

Continuation of SOC 501. Prerequisite: SOC 501.

SOC 503 Sociology as a Profession I. (1)*fall*

Becoming and working as a sociologist, including how to write a vita, choose a thesis topic, or find dissertation data. Prerequisite: graduate Sociology major.

SOC 504 Sociology as a Profession II. (1)*spring*

Becoming and working as a sociologist, including how to write a vita, choose a thesis topic, or find dissertation data. Prerequisite: graduate Sociology major.

SOC 505 Applied Regression Analysis. (3)*fall and summer*

Multiple linear regression topics relevant to sociological data analysis. Computer applications. Prerequisites: SOC 390 (or its equivalent); proficiency examination.

SOC 507 Social Statistics IIA: Categorical Data Analysis. (3)*fall*

Logistic regression and related topics relevant to categorical data analysis in sociology. Computer applications. Prerequisite: SOC 505 or instructor approval.

SOC 508 Social Statistics IIB: Structural Equation Analysis. (3)*spring*

Teaches structural equation models using LISREL and other computer packages. Topics include multiple group analyses and ordinal endogenous variable models. Prerequisite: SOC 505 or instructor approval.

SOC 509 Social Statistics IIC: Event History Analysis. (3)*fall and spring*

Proportional hazards models and other methods for analyzing longitudinal data and establishing hazard rates of events for exploratory variables. Prerequisite: SOC 505 (or its equivalent).

SOC 515 Studies of the Family. (3)*spring*

Current developments in the study of marriage and the family. Prerequisite: instructor approval.

SOC 585 Development of Sociology. (3)*fall*

Major sociological theorists, including Durkheim, Weber, Marx, Parsons, Merton, Dahrendorf, Homans, and Mead. Prerequisite: instructor approval.

SOC 586 Contemporary Sociological Theory. (3)*spring*

Analyzes major theories, including structural-functional, conflict, social exchange, symbolic interaction, and role theory. Prerequisite: instructor approval.

SOC 587 Contemporary Issues in Sociology. (3)
spring
 Philosophy of social science. Contemporary issues in sociological theory and methods. Prerequisite: instructor approval.

SOC 588 Methodological Issues in Sociology. (3)
spring
 Basic methodological issues in the application of scientific methods to the study of human social life. Emphasis on limited number of major works, with contrasting approaches to issues.

SOC 599 Thesis. (1-12)
not regularly offered

Department of Speech and Hearing Science

David Ingram
Chair
 (LL 173A) 480/965-2374
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PROFESSORS

S. BACON, CASE, DORMAN, D. INGRAM, WILCOX

ASSOCIATE PROFESSORS

LISS, SINEX

ASSISTANT PROFESSORS

AZUMA, GRAY, SHARMA

CLINICAL PROFESSOR

MATHY

CLINICAL ASSOCIATE PROFESSORS

C. BACON, BROWN, MINTZ, REMSON

CLINICAL ASSISTANT PROFESSORS

K. INGRAM, WEXLER

LECTURERS

BARTO, HOWARD, NEUMANN, O'BRIEN, QUINN, RIGGS

SPEECH AND HEARING SCIENCE—B.S.

The B.S. degree in Speech and Hearing Science consists of 45 semester hours of speech and hearing science courses emphasizing the developmental and scientific aspects of language, speech, and hearing. The following courses, or their approved equivalents, are required:

SHS 250 Introduction to Phonetics	3
SHS 310 Anatomical and Physiological Bases of Speech	3
SHS 311 Physical and Physiological Bases of Hearing	3
SHS 367 Language Science <i>SB</i>	3
SHS 375 Speech Science	3
SHS 376 Psychoacoustics	3
SHS 384 Hearing Disorders	3
SHS 401 Introduction to Audiologic Evaluation	3
SHS 402 Modifying Communicative Behavior	3
Choose two from the courses below	6
SHS 431 Development Speech Disorders (3)	3
SHS 470 Developmental Language Disorders (3)	3
SHS 485 Acquired Speech and Language Disorders (3)	3
SHS 450 Observation	1

SHS 465 Speech and Language Acquisition <i>SB</i>	3
SHS 496 Aural Rehabilitation	3
Total	40

The remaining speech and hearing science courses to complete the major are determined by the students in consultation with an advisor. A list of approved electives is available through the department. Supporting courses from related fields must include the following or their equivalents:

BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
MAT 170 Precalculus <i>MA</i>	3
PGS 101 Introduction to Psychology <i>SB</i>	3
PHY 101 Introduction to Physics <i>SQ</i>	4
PSY 230 Introduction to Statistics <i>CS</i>	3
Total	17

PSY 290 Research Methods (4) is strongly recommended.

MINOR IN SPEECH AND HEARING SCIENCE

The minor in Speech and Hearing Science consists of 24 semester hours with the following classes required:

SHS 105 Introduction to Human Communication Disorders	3
SHS 250 Introduction to Phonetics	3
SHS 310 Anatomical and Physiological Bases of Speech	3
SHS 311 Physical and Physiological Bases of Hearing	3
Choose one from the courses below	3
SHS 367 Language Science <i>SB</i> (3)	3
SHS 375 Speech Science (3)	3
SHS 376 Psychoacoustics (3)	3

The remainder of the 24 credits must come from the following courses:

SHS 320 Facilitating Speech and Language Development in Early Childhood	3
SHS 384 Hearing Disorders	3
SHS 401 Introduction to Audiologic Evaluation	3
SHS 402 Modifying Communicative Behavior	3
SHS 431 Developmental Speech Disorders	3
SHS 465 Speech and Language Acquisition <i>SB</i>	3
SHS 470 Developmental Language Disorders	3
SHS 485 Acquired Speech and Language Disorders	3
SHS 496 Aural Rehabilitation	3

GRADUATE PROGRAMS

The faculty in the Department of Speech and Hearing Science offer programs leading to the M.S. degree in Communication Disorders and Ph.D. degree in Speech and Hearing Science. See the *Graduate Catalog* for requirements.

SPEECH AND HEARING SCIENCE (SHS)

SHS 101 American Sign Language I. (4)

fall and spring

Basic receptive/expressive conversational skills; basic grammar and syntax rules. Orientation to deafness and deaf culture. Lecture, drill, practice, lab.

SHS 102 American Sign Language II. (4)

fall and spring

Further development of receptive/expressive conversation skills in ASL; finger spelling. Continued exploration of deaf culture. Lecture, drill, practice, lab. Prerequisite: SHS 101.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

SHS 105 Introduction to Human Communication Disorders. (3)*fall and spring*

Introduction to the nature and treatment of language disorders in children and adults. Lecture, demonstration.

SHS 201 American Sign Language III. (4)*fall and spring*

Continued development of fluency in ASL with emphasis on more abstract concepts and the ability to narrate events. Lecture, discussion, drill, lab. Prerequisite with a grade of "C" or higher: SHS 102.

SHS 202 American Sign Language IV. (4)*fall and spring*

Further development of fluency in ASL with emphasis on literature, folklore, and signing narratives with multiple characters. Lecture, discussion, drill, lab. Prerequisite with a grade of "C" or higher: SHS 201.

SHS 250 Introduction to Phonetics. (3)*fall*

Introduction to English phonetics with emphasis on phonetic transcription, articulation, phonology, and disorders of speech.

SHS 310 Anatomical and Physiological Bases of Speech. (3)*fall*

Noncadaveric study of anatomical systems that underlie human speech and language, including respiration, phonation, articulation, and related nervous system processes. Prerequisite: BIO 201.

SHS 311 Physical and Physiological Bases of Hearing. (3)*fall*

Studies the physical characteristics of sound and of the structure and function of the human auditory system. Prerequisites: BIO 201; PHY 101.

SHS 320 Facilitating Speech and Language Development in Early Childhood. (3)*fall and spring*

Speech and language development and strategies for facilitating communication skills in early childhood educational settings.

SHS 367 Language Science. (3)*fall*

Normative aspects and integration of language structure, comprehension, and production in children and adults.

*General Studies: SB***SHS 375 Speech Science. (3)***spring*

Normative aspects of speech, hearing, and language. Prerequisites: SHS 310, 311.

SHS 376 Psychoacoustics. (3)*spring*

Introduction to acoustics, cochlear anatomy and physiology, and the perception of sound. Prerequisite: SHS 311 or instructor approval.

SHS 384 Hearing Disorders. (3)*fall*

Pathologies of the ear and associated peripheral and central hearing disorders: characteristics, management, and effects on communication. Prerequisites: SHS 311, 376.

SHS 401 Introduction to Audiologic Evaluation. (3)*fall*

Measurement of the basic audiologic test battery, including audiograms, immittance, masking, and speech recognition. Prerequisites: SHS 311 and 376 and 384 (or their equivalents).

SHS 402 Modifying Communicative Behavior. (3)*fall*

Principles and techniques of modifying speech and language behavior. Prerequisite: SHS 250 (or its equivalent).

SHS 431 Developmental Speech Disorders. (3)*fall*

Introduction to the nature of articulation, fluency, resonance, and voice disorders in childhood. Prerequisites: SHS 250 and 310 (or their equivalents).

SHS 450 Observation. (1)*fall and spring*

Opportunity to obtain observation experience at the ASU Speech and Hearing Center or at external sites. Prerequisite: instructor approval.

SHS 465 Speech and Language Acquisition. (3)*spring*

Speech and language development in the normal child. Prerequisite: SHS 367 (or its equivalent).

*General Studies: SB***SHS 470 Developmental Language Disorders. (3)***fall*

Introduction to the nature and treatment of language disorders in children. Prerequisite: SHS 465 or instructor approval.

SHS 483 Professional Issues in Communication Disorders. (3)*fall*

Topics related to professional certification, accreditation, code of ethics, graduate education and other issues in speech-language pathology and audiology.

SHS 485 Acquired Speech and Language Disorders. (3)*spring*

Introduction to acquired speech and language disorders across the lifespan. Prerequisites: SHS 250, 310.

SHS 494 Special Topics. (1–4)*fall and spring*

May be repeated for credit. Possible topics:

(a) Hearing Disorders. (3)

(b) Research. (3)

(c) Speech and Language Disorders. (3)

Prerequisite: instructor approval.

SHS 496 Aural Rehabilitation. (3)*spring*

Approaches to aural rehabilitation of children and adults. Introduction to educational audiology and assistive listening devices. Prerequisites: SHS 375 and 376 and 401 (or their equivalents).

SHS 501 Introduction to Audiologic Evaluation. (3)*fall*

Measurement of the basic audiologic test battery, including audiograms, immittance, masking, and speech recognition. Prerequisites: SHS 311 and 376 and 384 (or their equivalents).

SHS 502 Differential Diagnosis for Audiology. (4)*fall*

Differential diagnosis of cochlear and retrocochlear disorders, and assessment of vestibular system. 3 hours lecture, 2 hours lab. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 504 Hearing Aids. (4)*spring*

Operation, application, and fitting of amplification devices for the hearing impaired. 3 hours lecture, 2 hours lab. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 508 Pediatric Audiology. (3)*fall*

Audiologic assessment, screening, and development considerations for infants and young children. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 511 Auditory Perception by the Hearing Impaired. (3)*fall*

Studies how and why sensorineural hearing loss alters the perception of sound. Prerequisite: SHS 376 or instructor approval.

SHS 512 Medical Aspects of Speech and Hearing. (3)*fall*

Correlation of history and physical findings with pathologic physiology and test results in speech and hearing abnormalities.

SHS 515 Audiologic Instrumentation and Calibration. (3)*fall*

Electronic instruments used to produce, modify, and measure characteristics of sound. Measurement standards and methods for calibration of audiologic equipment. Lecture, lab. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 516 Auditory-Evoked Potentials. (4)*spring*

Continuation of SHS 502, including electrophysiologic assessment of peripheral and central auditory nervous system. Lecture, lab. Prerequisite: SHS 502.

SHS 545 Speech Perception by the Hearing Impaired. (3)*fall*

Speech perceptual problems of the hearing impaired including those who have cochlear implants. Prerequisite: SHS 375 or instructor approval.

SHS 552 Otoacoustic Emissions as a Diagnostic Tool. (3)*spring*

Studies the types of otoacoustic emissions, their theoretical implications and application to clinical diagnostics. Lecture, discussion, lab. Prerequisite: SHS 376 or instructor approval.

SHS 555 Cochlear Implants. (3)*spring*

Current status of cochlear implant research and development. Prerequisites: both SHS 504 and 545 or only instructor approval.

SHS 565 Speech and Language Acquisition. (3)*spring*

Speech and language development in the normal child. Prerequisite: SHS 367 (or its equivalent).

SHS 566 Psychology of Language. (3)*spring*

Psycholinguistic study of the production and comprehension of language across the lifespan.

SHS 567 Neural Bases of Communication Disorders. (3)*fall*

Neuroscience and its application to matters of normal and disordered communication. Pre- or corequisite: SHS 310 (or its equivalent).

SHS 570 Communication Disorders and Multicultural Populations. (3)*spring*

Studies racial and ethnic biases and the communication behaviors and disorders in various cultural groups.

SHS 571 Augmentative Communication and Language Programming. (3)*spring*

Focuses on individuals across the age span who are unable or who are at risk for being unable to communicate with spoken language. Lecture, lab.

SHS 572 Language Assessment and Intervention in Early Childhood. (3)*fall*

Focuses on the birth to 5-year-old population who are at risk for or who have communication and language disabilities. Prerequisite: SHS 470 (or its equivalent).

SHS 573 Language Assessment and Intervention with School-Age Populations. (3)*spring*

Focuses on later language development, linguistic demands of academic settings, assessment and intervention strategies for older children and adolescents. Prerequisite: SHS 565 (or its equivalent).

SHS 574 Fluency Disorders and Treatment. (3)*fall*

Presents phenomena, etiology, assessment, and theories of stuttering, followed by various treatment procedures for children and adults who stutter. Prerequisite: SHS 431 (or its equivalent).

SHS 575 Aphasia and Related Neurogenic Language Disorders. (3)*fall*

Assessment and treatment of acquired neurolinguistic impairment. Prerequisite: SHS 567.

SHS 576 Neuromotor Speech Disorders. (3)*spring*

Evaluation and treatment of the dysarthrias and apraxia of speech. Emphasis on acquired adult disorders.

SHS 577 Craniofacial Disorders of Communication. (3)*summer*

Communication disorders related to anomalies of the craniofacial structures, including orofacial clefting of the lip and palate. Prerequisite: SHS 310 (or its equivalent).

SHS 578 Disorders of Voice. (3)*spring*

Communication disorders related to dysfunction of the phonatory and resonance systems of voice production, assessment, and treatment. Prerequisite: SHS 310 or instructor approval.

SHS 579 Feeding and Swallowing Disorders Across the Lifespan. (3)*fall*

Focuses on individuals across the age span who have feeding and/or swallowing disorders. Presents assessment and treatment strategies. Prerequisite: SHS 567.

SHS 580 Clinical Practicum. (1–6)*fall, spring, summer*

Supervised practicum in audiology or speech-language pathology. 1 hour staffing and 3 hours of client contact per week per hour of credit. May be repeated for credit. Prerequisites: instructor approval; student must not have provisional admission status.

SHS 581 Right Hemisphere Syndrome, Traumatic Brain Injury, and Dementia. (3)*spring*

Studies the nature, characteristics, and clinical management of cognitive and communicative impairments accompanying right hemisphere damage, TBI, and dementia. Prerequisite: SHS 567.

SHS 582 Differential Diagnosis of Communication Disorders. (3)*spring*

Procedures for assessing speech/language disorders in children and adults. 3 hours lecture, 2 hours lab. Prerequisites: SHS 250 and 310 and 465 and 567 (or their equivalents).

SHS 584 Internship. (1–6)*fall, spring, summer*

Off-campus directed experiences in audiology or speech-language pathology. May be repeated for credit. Prerequisites: SHS 580; student must consult with coordinator before registration.

SHS 585 Articulation and Phonology: Assessment and Intervention. (3)*spring*

Assessment and treatment of developmental articulation and phonological disorders. Prerequisites: SHS 250 and 310 (or their equivalents).

SHS 591 Seminar. (1–12)*fall, spring, summer*

Possible topics:

- Central Auditory Mechanisms and Learning Impairment. (3)
spring
- Cognitive and Linguistic Interactions in Adult Neurogenic Disorders. (3)
fall
- Fundamentals of Vestibular Evaluations. (3)
fall
- Research Methods in Communication Disorders. (3)
spring

SHS 596 Aural Rehabilitation. (3)*spring*

Approaches to aural rehabilitation in children and adults. Introduction to educational audiology and assistive listening devices. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 792 Research. (1–12)*not regularly offered***SHS 799 Dissertation. (1–15)***not regularly offered*

Women's Studies Program

Kathleen J. Ferraro
Director
 (ECA 209) 480/965-2358
www.asu.edu/clas/womens_studies

CORE FACULTY

Professors: Koblitz, Rothschild;
 Associate Professors: Ferraro, Scheiner;
 Assistant Professors: Anderson, Leong, Lind

AFFILIATED FACULTY

Anthropology

Professors: Brandt, Koss-Chiono

Architecture

Assistant Professor: Ewan

Art

Professors: Codell, Fahlman, Magenta;
 Associate Professor: Schleif

Art History

Associate Professor: Wolfthal

Chicana and Chicano Studies

Professor: Ruiz;
 Assistant Professor: Gutierrez

Curriculum and Instruction

Professors: Edelsky, Guzetti

English

Professors: Adams, Crowley, Gutierrez, Lightfoot,
 Nilsen, Rhodes, Richard, Sensibar;
 Associate Professors: Chancy, DeLamotte, Horan, Morgan,
 Pritchard, Tohe;
 Assistant Professors: Thompson, Webb Peterson;
 Senior Lecturer: Obermeier;
 Lecturers: Heenan, Norton

Exercise and Wellness (ASU East)

Assistant Professor: Swan

Exercise Science and Physical Education

Professor Emeritus: Wells

Family and Human Development

Professor: Martin

Geography

Professor: Burns

History

Professors: Fuchs, Giffin, Lavrin, Warnicke;
 Associate Professors: Gray, Gullet, Hendricks, Stoner

Human Communication

Professors: Carlson, Nakayama, Valentine;
 Assistant Professors: Davis, Martinez

Justice Studies

Professors: Jurik, Romero, Zatz;
 Assistant Professors: Adelman, Bernstein, Menjivar

Languages and Literatures

Professors: Foster, Losse;
 Associate Professors: Pritchard, Tompkins;
 Assistant Professors: Choi, George, Gruzinska, Rees;
 Assistant Research Professional: Orlich

Management

Associate Professor: Cook

Music

Professor: Williamson

Philosophy

Associate Professor: McGregor

Psychology

Regents' Professors: Eisenberg, Russo;
 Professor: Chassin;
 Associate Professor: Saenz

Psychology in Education

Professors: Bernstein, Hackett, Kerr;
 Professors Emeriti: McIsaac, Wilson;
 Associate Professor: Moore

Recreation Management and Tourism

Professor: Allison

Religious Studies

Professor: Feldhaus;
 Associate Professor: Fessenden

Social Work

Professors: Coudroglou, Segal;
 Associate Professors: Brzuzy, Gerdes;
 Assistant Professor: Hurdle

Sociology

Professors: Gordon, Kronenfeld, Kulis, Laner, Weitz;
 Associate Professors: Benin, Miller-Loessi;
 Assistant Professor: Agadjanian

Theatre

Professor: Knapp

Women's Studies (ASU West)

Professor: Stage

The Women's Studies Program is an interdisciplinary university program housed in the College of Liberal Arts and Sciences. Information on faculty affiliation is provided for reference.

WOMEN'S STUDIES—B.A.

Women's Studies provides our students with an intensive interdisciplinary liberal arts education that enables them to write well, think critically, and analyze problems effectively. Our students take a variety of courses, including a capstone seminar requiring original research and writing, and an internship that helps them prepare for life after college. Original undergraduate research is encouraged, and some courses involve students in studying community problems and formulating policy solutions.

The B.A. degree in Women's Studies consists of 45 semester hours (with a grade of "C" or higher), of which 33 must be taken from WST or WSH prefixes or from other prefixes designated as part of the major. The other 12 must be in closely related fields chosen in consultation with an academic advisor. At least 36 of the 45 semester hours required for the major must be completed in upper-division courses.

All Women's Studies majors must compile a portfolio to leave on file in the Women's Studies Program office upon graduation.

Required Courses. Students must complete the following courses:

WST 100 Women and Society <i>SB, C</i>	3
or WST 300 Women in Contemporary Society <i>SB, C</i> (3)	
WST 377 Creation of Feminist Consciousness <i>L, C</i>	3
WST 378 Contemporary Feminist Theory <i>L, C</i>	3
WST 484 Internship	3
WST 498 PS: Theoretical Issues in Women's Studies <i>L</i>	3
Total	15

Students must also complete two other courses: (1) an upper-division course that provides a humanities or fine arts perspective on the lives and contributions of women; and (2) an upper-division course on women in non-Western societies or a course on minority or ethnic women in American society.

A list of approved courses is available each term in the program office. No course may be used to satisfy more than one requirement.

Electives in Closely Related Fields. Majors must complete 12 hours of courses in fields closely related to women's studies. These courses may be used to satisfy university General Studies requirements and graduation requirements in the College of Liberal Arts and Sciences. WST and WSH courses may not be used as related fields.

MINOR IN WOMEN'S STUDIES

The Women's Studies minor consists of 18 semester hours, 12 of which must be in the upper division. The following courses are required:

WST 100 Women and Society <i>SB, C</i>	3
or WST 300 Women in Contemporary Society <i>SB, C</i> (3)	
WST 377 Creation of Feminist Consciousness <i>L, C</i>	3
or WST 378 Contemporary Feminist Theory <i>L, C</i> (3)	
Total	6

Twelve additional hours of approved women's studies courses must be taken after consultation with the women's studies advisor.



The ASU and University of Tennessee women's basketball teams faced-off in Bank One Ballpark, in downtown Phoenix, in the first-ever outdoor collegiate basketball game, raising money for women's breast cancer research.

Tim Trumble photo

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Students pursuing a minor must register at least one semester before graduation and are encouraged to meet with the women's studies academic advisor early in their course of studies.

CERTIFICATE PROGRAM IN WOMEN'S STUDIES

The certificate program is equivalent to an interdisciplinary minor, consisting of 18 semester hours, and is open to graduate as well as undergraduate students. Students pursuing a certificate must consult with the women's studies advisor. See "Women's Studies," page 327, for a description of the certificate program.

GRADUATE STUDIES

Although the Women's Studies Program does not offer a graduate degree, it is possible to pursue a graduate degree in some existing programs with a thesis or dissertation topic related to women's studies. Information on such programs can be obtained from the Women's Studies Program office.

COURSES IN WOMEN'S STUDIES

Additional courses appear as Special Topics and vary semester to semester. A list of approved interdisciplinary courses that count toward the requirements for the major, minor, and certificate in Women's Studies is available each term in the program office, ECA 209.

WOMEN'S STUDIES HUMANITIES (WSH)

WSH 413 Lesbian Culture: Images and Realities. (3)

spring
Explores aspects of lesbian experience from sociological, psychological, historical, political, and literary critical perspectives. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: HU, C

WSH 464 Voices and Visions. (3)

fall and spring
Explores the contributions of visionary women in the humanities; topics vary from semester to semester. May be repeated for credit when topics vary. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: HU, C

WSH 470 Women and Popular Culture. (3)

spring
Interdisciplinary examination of how gender is constructed in popular cultural forms. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: HU, C

WOMEN'S STUDIES (WST)

WST 100 Women and Society. (3)

fall, spring, summer
Interdisciplinary introduction examining critical issues in women's studies. Credit is allowed for only WST 100 or 300.
General Studies: SB, C

WST 294 Special Topics. (1–4)

not regularly offered
Possible topics:
(a) Women and Social Action
Fee.

WST 300 Women in Contemporary Society. (3)

fall, spring, summer
Intensive interdisciplinary examination of such topics as gender roles, work, education, sexuality, politics, health, and law. Credit is allowed for only WST 300 or 100.
General Studies: SB, C

WST 313 Women and Sexuality. (3)

fall and spring
Explores feminist theories about women's sexuality and the relationship of these theories and related research to women's experience. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB

WST 360 Women as Healers. (3)

spring
Examines the role of women as caregivers, healers, physicians, midwives, and nurses in different cultures and historical periods. Lecture, discussion.

WST 372 Women in Judaism. (3)

spring
Studies the legal, social, and cultural status of Jewish women in various historical and contemporary societies. Cross-listed as REL 373. Credit is allowed only for REL 373 or WST 372.

WST 373 Latina/Chicana Issues. (3)

fall and spring
Examines the roles Mexican American, Chicana, and/or Latina immigrant women play historically, socially, and politically in the United States. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C

WST 375 Women and Social Change. (3)

fall and spring
Combines research and theory on a contemporary social problem with a community action experience focusing on women's social change initiatives. Lecture, field placement. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C

WST 377 Creation of Feminist Consciousness. (3)

fall
Explores the development of feminist theory from its roots to 1960. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L, C

WST 378 Contemporary Feminist Theory. (3)

spring
Contemporary feminist theories and exploration of the intersection of gender, race, ethnicity, and class through critical analysis. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L, C

WST 380 Gender, Race, and Class. (3)

fall and spring
Explores cultural diversity, class, and gender issues in American social life. Lecture, seminar, analysis papers, and writing. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L/SB, C

WST 457 Gender, Culture, and Development. (3)

fall and spring
Economic, cultural, and sociopolitical contexts for understanding women's roles related to health, family, work, education, and politics in developing countries. Prerequisite: 6 hours in social science or instructor approval.
General Studies: L/SB, G

WST 460 Women and the Body. (3)

fall and spring
Interdisciplinary look at how representations of woman as body permeate culture and affect a woman's sense of self. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C

WST 477 Women and Violence. (3)

fall
Global examination of forms of violence against women at the individual, institutional, and cultural levels, and efforts to control it. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C

WST 484 Internship. (1–3)

fall and spring
Practical experience to enhance the academic perspectives that emerge from women's studies instruction. Prerequisite: internship coordinator approval.

WST 498 PS: Theoretical Issues in Women's Studies. (3)

fall and spring
Reading and research on important theoretical issues in women's studies. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L

College of Nursing

Barbara Durand, Ed.D., Dean

www.asu.edu/nursing



Nursing student Mia Kilmartin Smitt (left), listens to the heartbeat of a child at the Community Services Health Clinic, as Collette Toronto, a nurse practitioner, supervises.

Dave Tevis photo

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PURPOSE

The faculty in the College of Nursing acknowledge their responsibility to health care consumers for the preparation of individuals who provide nursing care of professional quality through teaching, research practices, and service. The purpose of the College of Nursing is to provide educational programs that prepare professional nurses to meet the health care needs of individuals, groups, and communities. To achieve this purpose, the college offers undergraduate, graduate, and continuing and extended education programs. Within the context of a liberal education, the degree programs prepare professional nurses who

1. provide the highest-quality health care to individuals, groups, and communities and who critically examine and effectively respond to the changing health care needs of society;
2. conduct research and creative activity that strengthen the knowledge base of the discipline, improve theory-based nursing practice, and benefit the health of individuals, groups, and communities; and
3. provide service to the community through a range of nursing activities with diverse populations in a variety of settings.

The continuing and extended education program facilitates lifelong learning by providing opportunities for registered nurses (RNs) to enhance and expand their nursing practice to meet the health care needs of various populations and to further their own professional development.

ORGANIZATION

The College of Nursing is organized around two major clinical divisions: adult health/parent-child nursing and community health/psychosocial nursing systems.

The college offers an undergraduate program leading to a Bachelor of Science in Nursing (B.S.N.) degree, a graduate program leading to an M.S. degree with preparation for advanced practice in nursing, and continuing and extended education opportunities for RNs, which include RN-B.S.N. and RN-B.S.N.-M.S. programs.

The college also participates with the University of Arizona in offering the Master of Public Health degree.

ADMISSION

Preprofessional Admission. Students are admitted into the College of Nursing as “premajor Nursing” students. Admission to ASU as a premajor Nursing student does not guarantee admission into the professional program. Admission to

the professional program is competitive, with the greatest emphasis placed on prerequisite grade point average.

In addition to meeting the university requirements for admission, it is recommended that students complete one year each of high school chemistry and biology.

Premajor Nursing students are required to seek academic advising each semester through the College of Nursing Student Services Office. This advising includes course planning as well as information regarding application materials and deadlines.

Transfer Credits. While the university accepts transfer credit from other accredited institutions, all transfer credit may not apply toward a B.S.N. degree. Students completing course work at a community college or university other than ASU should consult a College of Nursing academic advisor to plan an appropriate sequence of prerequisite courses and to apply to the professional program. The college may not accept transfer credit (especially science) completed more than 10 years before the date of application.

Professional Program Admission. Individuals interested in applying to the professional program must receive advising from a College of Nursing academic advisor and may be required to attend an application workshop. Contact the Student Services Office in the College of Nursing at 480/965-2987 for details. Students are eligible for consideration for admission to the professional program if they meet the following criteria:

1. regular admission to the College of Nursing at ASU Main as a premajor Nursing student;
2. good standing with ASU and the College of Nursing;
3. minimum prerequisite GPA of 2.75;
4. completion of designated prerequisite courses with an earned grade of "C" or higher in each course;
5. completion of all application materials;
6. submission of required health and immunization information;
7. a Test of English as a Foreign Language (TOEFL) score of 550 or higher for international students; and
8. submission of other required materials.

Admission is selective and based on available resources. Meeting the minimum prerequisite GPA does not ensure admission. All qualified applicants may not be admitted. Students admitted to the professional program are required to meet the following additional criteria:

1. proof of CPR certification (Level C American Heart Association Health Care Provider);
2. proof of negative drug screen;
3. completion of all required health and immunization information;
4. eligible for class one fingerprint clearance card;
5. removal of all admission deficiencies; and
6. other required material.

Professional program courses are offered at ASU Main and ASU West. Students are asked to specify location preference as part of the application process. Students are

expected to complete the professional program on the campus assigned upon admission.

Professional Program Transfer. Students requesting to transfer into the professional program with advanced standing may be required to submit letters of recommendation. Any student enrolled in good standing at any accredited/ approved baccalaureate school of nursing within the past two years may apply for admission into the professional program. To be considered for admission to the professional program, transfer students must first be admitted to ASU as premajor Nursing students (see "Undergraduate Admission," page 54) and must also meet all professional program admission requirements. To be considered for advanced standing in the professional program courses, petitions for each course must be completed by the student with accompanied course descriptions and syllabus materials and be approved by the College Standards Committee.

Admission of Registered Nurses (RNs). All RN students are admitted into the College of Nursing as premajor Nursing students. An RN must submit a photocopy of his or her current license to practice nursing as an RN in Arizona. RN students are responsible for adhering to Arizona State Board of Nursing Rules and Regulations. Alternatives are available to RNs to facilitate their progress in the program, including credit by examination and substitution of previously completed nursing courses for specified ASU nursing courses, and transfer of general education course work completed at other accredited colleges and universities. All RN students must consult with an advisor in planning their program of study. See "Professional Program Admission," page 456, for admission criteria into the B.S.N. professional program. Registered nurses are admitted into the RN-B.S.N. program twice a year, in January and in August.

Additional admission criteria required for application to the RN-B.S.N.-M.S. program track include submission of

1. GRE scores;
2. current résumé;
3. statement of career goals;
4. letters of reference;
5. interview;
6. minimum prerequisite GPA of 3.0; and
7. other required materials.

RNs are accepted into the RN-B.S.N.-M.S. program track once a year (in January).

Readmission to the Professional Program. Students who have not been in continuous enrollment must file a petition requesting readmission to the professional program and must provide the following documents:

1. proof of current enrollment or readmission to ASU and the College of Nursing;
2. transcripts from all colleges attended; and
3. all other admission requirements as outlined under "Admission," page 455.

Arizona State Board of Nursing Requirement. To be eligible to write the National Council Licensure Examination for Registered Nurses (NCLEX-RN), a student must have a high school diploma or GED certificate as well as proof of graduation from an approved nursing program. Arizona

State law prohibits an individual convicted of a felony from applying for nursing licensure or certification until five years after the date of absolute discharge of the sentence. Application for, and passage of, the NCLEX-RN is the sole responsibility of the student.

College Health Requirements. Students admitted/enrolled in the professional program are responsible for fulfilling the requirements of the health policies of the College of Nursing. The student is responsible for providing proof to the College of Nursing Student Services Office of having met these requirements before enrollment in the professional program courses. These health policies include the following requirements:

1. proof of measles (rubeola), mumps, and rubella immunization (MMR);
2. proof of annual tuberculosis screening;
3. completed series of hepatitis B vaccine;
4. current American Heart Association Level C CPR Certification;
5. proof of tetanus, diphtheria immunization (TD);
6. proof of varicella (chicken pox) immunization; and
7. proof of negative drug screen.

An annual flu vaccine is recommended and other health information may also be required.

A Nursing student may not participate in any clinical experience without meeting these requirements.

Essential Functions. Students admitted to the professional program are expected to meet the Essential Functional Abilities of the Undergraduate Nursing Student. Essential functions for this program include gathering data through the senses (hearing, seeing, etc.), synthesizing information from a variety of sources, making decisions regarding patient care, and performing necessary physical and mental activities to ensure safe care. For complete details, contact an advisor in the Student Services Office at NUR 108, or call 480/965-2987.

ASU Health Requirements. See “Undergraduate Admission,” page 54, and “Immunization Requirements,” page 60.

Professional Liability Insurance. It is highly recommended that students carry their own professional liability insurance when enrolled in clinical nursing courses.

Health and Accident Insurance. It is strongly recommended that all students carry their own health and accident insurance. Some clinical agencies require students to have current health insurance. See the *Undergraduate Student Handbook*. Each student is personally responsible for costs related to any accident or illness during or outside of school activities.

Automobile Insurance. Students are required by state law to carry automobile insurance. Students are responsible for transportation to and from clinical sites. Extensive travel may be required for selected clinical experiences.

ADVISING

While the College of Nursing provides academic advising, *it is ultimately the responsibility of each student to fulfill academic and program requirements.* Advisors are available by appointment in the College of Nursing Student Services Office. Visit NUR 108, or call 480/965-2987. Advisors assist students with program planning, registration, preparation of needed petitions, verification of graduation requirements, referrals to university and community resources, and career planning.

Student responsibilities include following university guidelines regarding submission of transcripts from all colleges other than ASU, obtaining the necessary signatures or computer verifications required by the university, and following university procedures for matriculation.

Mandatory Advising. All premajor Nursing students are required to meet with an academic advisor before registering for each semester of classes. In general, all students are encouraged to meet with an advisor each semester. All students on probation are required to meet with an advisor to plan strategies for improving their academic standing.

Program of Study. Students following the curriculum requirements of the 1994–1996 or earlier catalog editions must file a program of study during the first semester of enrollment in the professional program and before registration for professional program Junior Two (JR2) level courses.

Declaration of Graduation. Students following the curriculum requirements of the 1996–1998 or later catalog editions must file a Declaration of Graduation form using the Degree Audit Reporting System during enrollment in the second semester of the professional program.

Student Employment. Each of the four semesters in the professional program is composed of 16 semester hours. Seven to eight of these semester hours reflect two to three days in practicum experience. The remaining eight semester hours reflect classroom hours requiring preparation and study. It is suggested that any additional activities or employment be kept at a minimum.

DEGREES

Nursing—B.S.N.

The completion of the curriculum leads to a Bachelor of Science in Nursing (B.S.N.) degree. The purpose of the program is to prepare beginning professional nurses, who possess the theoretical foundation and the clinical competence, to function in various health care settings. The graduate is prepared to deliver nursing care services to individuals, families, population groups, and communities. The undergraduate program provides students with a foundation for graduate studies in nursing at the master’s level.

Program objectives for the undergraduate curriculum are directed toward preparation of graduates with generalist abilities. Based on theoretical and empirical knowledge from nursing, the humanities, and physical, biological, and behavioral sciences, graduates are prepared to

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

1. combine theoretical knowledge from the sciences, humanities, and nursing as a base for critical thinking in professional nursing practice and develop an understanding of client, healthy environment, and nursing;
2. organize the nursing process to provide safe, competent, and effective nursing care using principle-based communication, technical/psychomotor, teaching, management, and therapeutic skills;
3. design and generate comprehensive therapeutic nursing care in partnership with individuals, families, groups, and communities, including those who are culturally diverse and/or vulnerable;
4. generate their own professional practice that focuses on health promotion, health restoration, health maintenance, and illness care from a holistic perspective;
5. analyze and apply research findings to nursing practice and identify nursing research problems;
6. display values and behavior consistent with the culture of professional nursing;
7. display personal and leadership characteristics appropriate for professional nursing practice;
8. display responsibility and accountability for professional nursing practice;
9. collaborate with nurses, other health care providers, and clients in the delivery of holistic care that is responsive to changing needs and societal trends; and
10. analyze current nursing and health care services and trends, and identify future health care needs.

Nursing—RN Programs

Courses have been designed to expand the knowledge base of the RN. Practice experiences in home health, community health, and leadership prepare RNs for roles on the cutting edge of health care. Programs of study are developed and implemented that reflect individual capabilities, prior educational learning experiences, and career goals of RNs. Faculty and academic advisors work with RN students to maximize learning experiences and plan the program that meets their unique needs and interests.

Two program tracks are available for RNs. The RN-B.S.N. *only* and the RN-B.S.N.-M.S. program tracks are structured to provide an accessible, accelerated, and predictable pathway through the program.

RN-B.S.N. Only. The RN-B.S.N. *only* program track offers RNs the opportunity to complete remaining degree requirements in one calendar year in a program featuring reasonable costs, predictable year-round course scheduling, reduced in-class time, and a variety of instructional delivery methods, including Web-enhanced and Web-based courses. Satisfactory completion of all general education and nursing prerequisite courses with a grade of “C” or better and an earned minimum prerequisite GPA of 2.75 is required. RNs are accepted into the RN-B.S.N. *only* program track twice a year (January and August). See “Admission of Registered Nurses (RNs),” page 456.

RN-B.S.N.-M.S. The RN-B.S.N.-M.S. program track, designed for highly motivated and experienced RNs, reflects an expansion of the RN-B.S.N. *only* option. It provides for more rapid progression to graduate education that builds on

the existing undergraduate curriculum and enables RN students to take selected graduate courses (earning a grade of “B” or greater) that apply toward their baccalaureate degree. Satisfactory completion of all general education and nursing prerequisite courses with a grade of “C” or better and an earned minimum prerequisite GPA of 3.00 is required. See “Admission of Registered Nurses (RNs),” page 456.

Nursing—M.S.

The faculty in the College of Nursing offer a program leading to an M.S. degree in Nursing with concentrations in adult health nursing, community health nursing, community mental health/psychiatric nursing, family health nursing, women’s health, and parent-child nursing with options in childbearing family and nursing of children. The program requires a minimum of 40 semester hours with an earned grade of “B” or higher in all courses in the program of study. Students in the nurse practitioner options are required to complete additional semester hours. Requirements for this program are described in the *Graduate Catalog*. Persons interested in applying for admission to the program should write to the Graduate College for a *Graduate Catalog* and application form (see “Admission to the Graduate College,” page 504) and contact the College of Nursing Student Services Office.

PUBLIC HEALTH—M.P.H.

The School of Health Administration and Policy and the College of Nursing, at ASU, in conjunction with the University of Arizona and Northern Arizona University, offer courses leading to the Master of Public Health degree. Two concentrations are offered at ASU: (1) Community health practice is coordinated by the College of Nursing, and (2) health administration and policy is coordinated by the School of Health Administration and Policy. For more information, see the *Graduate Catalog*.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements. For more information, see “University Graduation Requirements,” page 74.

First-Year Composition Requirement

Completion of both ENG 101 and 102 or ENG 105 or equivalent with a grade of “C” or higher is required for graduation from ASU in any baccalaureate degree program.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement of a minimum of 35 semester hours of approved course work in General Studies, as described in “General Studies,” page 78. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses. Many of the university General Studies requirements may be met through completion of College of Nursing course requirements. See an academic advisor for details. General Studies courses are listed in the “General Studies Courses” table, page 81, in the course descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

COLLEGE DEGREE REQUIREMENTS

College requirements for graduation are consistent with those of the university. The B.S.N. degree requires 120 semester hours.

Prerequisite Course Requirements

The following courses must be completed before enrolling in the professional program. Completion of these courses does not ensure admission to the professional program. RN students should refer to “RN—B.S.N. Degree Requirements (RNs),” on this page.

BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
BIO 202 Human Anatomy and Physiology II.....	4
CDE 232 Human Development <i>SB</i>	3
CHM 101 Introductory Chemistry <i>SQ</i>	4
ENG 101 First-Year Composition.....	3
ENG 102 First-Year Composition.....	3
HCR 210 Clinical Health Care Ethics <i>HU</i>	3
HCR 220 Health Care Organizations <i>L</i>	3
HCR 230 Culture and Health <i>C, G</i>	3
HCR 240 Human Pathophysiology.....	4
MAT 117 College Algebra <i>MA</i>	3
MIC 205 Microbiology <i>SG</i>	3
MIC 206 Microbiology Laboratory <i>SG</i>	1
NTR 241 Human Nutrition.....	3
PGS 101 Introduction to Psychology <i>SB</i>	3
PHI 103 Principles of Sound Reasoning <i>L/HU</i>	3
C, H elective.....	3
CS statistics elective.....	3
Total prerequisites.....	56

MAJOR REQUIREMENTS

The Nursing major requirements are completed after admission to the professional program. RN students should refer to “RN—B.S.N. Degree Requirements (RNs),” on this page.

Nursing Core Courses

Junior Year

First Semester

NUR 341 Theory I: Health Integrity.....	4
NUR 351 Pharmacology in Nursing.....	3
NUR 361 Professional Development I.....	2
NUR 381 Nursing Practice I.....	7
Total.....	16

Second Semester

NUR 342 Theory II: Health Integrity and Alterations.....	5
NUR 362 Professional Development II: Nursing Research <i>L</i>	3
NUR 382 Nursing Practice II.....	8
Total.....	16

Senior Year

First Semester

NUR 441 Theory III: Health Integrity and Alterations.....	6
NUR 461 Professional Development III: The Art of Nursing <i>HU</i>	3
NUR 481 Nursing Practice III.....	7
Total.....	16

Second Semester

NUR 442 Theory IV: Health Integrity and Alterations.....	3
NUR 443 Theory V: Leadership and Management.....	3
NUR 462 Professional Development IV.....	2
NUR 482 Nursing Practice IV.....	8
Total.....	16
Nursing core total.....	64

Each semester of courses is prerequisite to subsequent semesters. See an advisor for current program information.

RN—B.S.N. DEGREE REQUIREMENTS (RNs)

Prerequisite Course Requirements

BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
BIO 202 Human Anatomy and Physiology II.....	4
CDE 232 Human Development <i>SB</i>	3
CHM 101 Introductory Chemistry <i>SQ</i>	4
ENG 101 First-Year Composition.....	3
ENG 102 First-Year Composition.....	3
HCR 240 Human Pathophysiology*.....	4
MAT 117 College Algebra <i>MA</i>	3
MIC 205 Microbiology <i>SG</i>	3
MIC 206 Microbiology Laboratory <i>SG</i>	1
NTR 241 Human Nutrition.....	3
NUR 341 Theory I: Health Integrity*.....	4
NUR 342 Theory II: Health Integrity and Alterations*.....	5
NUR 351 Pharmacology in Nursing*.....	3
NUR 361 Professional Development I*.....	2
NUR 381 Nursing Practice I*.....	7
NUR 382 Nursing Practice II*.....	8
PGS 101 Introduction to Psychology <i>SB</i>	3
C, H elective.....	3
CS statistics elective.....	3
HU elective.....	3
Total prerequisites.....	76

* For alternatives, see an advisor.

General Education Courses

Electives (upper division).....	6
G course (upper division).....	3
Total.....	9

Professional Nursing Courses for RNs. The following nursing courses are listed in order of course progression and are taught one day a week over a period of 12 months. Practice course scheduling may vary (e.g., day of week, time of day).

NUR 362 Professional Development II: Nursing Research <i>L</i>	3
NUR 391 Registered Nurse Mobility I: Professional Development <i>L</i>	3
NUR 392 Registered Nurse Mobility II: Health and Wellness.....	3
NUR 441 Theory III: Health Integrity and Alterations.....	6
NUR 442 Theory IV: Health Integrity and Alterations.....	3
NUR 443 Theory V: Leadership and Management.....	3
NUR 461 Professional Development III: The Art of Nursing <i>HU</i>	3
NUR 462 Professional Development IV.....	2
NUR 495 Community Health/Home Health Nursing Practice.....	4

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

NUR 496 Leadership and Management Practice for RNs	5
Total	35
General elective total	9
Nursing core (RN) total	44

RNs interested in pursuing the RN-M.S. track should contact an advisor in the College of Nursing Student Services Office.

ACADEMIC STANDARDS

Students are admitted into the College of Nursing as pre-major Nursing students and are subject to the general standards of academic good standing at the university. However, students who maintain standards of academic good standing do not necessarily qualify for admission into the professional program.

Consideration for admission into the professional program is contingent on achieving at least a “C” in all prerequisite courses and earning a minimum GPA of 2.75 in prerequisite courses. In addition, a grade of “C” or higher is required in all course work for the degree except in nursing practice courses where a designation of a passing grade is required.

Once admitted into the professional program, students are allowed only one nursing course failure within the program. The second failure in a nursing course leads to an automatic disqualification from the College of Nursing.

Probation and/or disqualification is in accordance with university policies. Academic dishonesty is not tolerated in any course and is subject to specific College of Nursing policies and procedures.

GRADING POLICY FOR NURSING COURSES

Within the undergraduate program, grades are assigned to reflect levels of achievement in relation to course objectives. Students who do not complete a required nursing course satisfactorily, receiving a grade of “D” or “E” (failing) or a mark of “W” (withdrawal), are not eligible to progress in the professional program. A student who withdraws from a course with a failing grade reported as an “E3” or “E9” is considered to have failed the course.

Any petition for curriculum adjustment, course substitution, overload, readmission to a nursing course, or readmission to the professional program must be approved by the College Standards Committee.

Withdrawal is in accordance with the withdrawal policy of the university. Students are responsible for completing the university withdrawal procedure. To be considered for reenrollment in a professional program course, a completed petition must be submitted and approved by the College Standards Committee. See an academic advisor for assistance.

An incomplete in a required nursing course must be satisfactorily removed before progression in the professional program is permitted. A grade of “I” is not allowed in clinical courses. See “Grading System,” page 67, for university policy.

Audited courses are not accepted as course credit in the minimum 120-semester-hour requirement for graduation.

STUDENT RESPONSIBILITIES

Health. Students in the College of Nursing who exhibit or demonstrate a lack of physical and mental health necessary to function effectively as a professional nurse may be required to complete a health examination and have the results made available to the College Standards Committee. Students whose health, behavior, and/or performance have been questioned are reviewed for continuation in nursing courses by the College Standards Committee. The student may appear in person before the committee and personally present information relevant to the committee’s review.

Information may also be presented in writing without making a personal appearance.

Professional. Students are held to the professional standards reflected in the American Nurses’ Association Code for Nurses. Professional behavior and appearance are required during all nursing course activities.

Student Transportation. Students are responsible for their own transportation to and from health agencies and other selected experience settings, such as home visits to clients. Extensive travel may be required for selected clinical experiences.

Laboratory Fees. In several nursing laboratory and clinical courses, students are provided an opportunity to practice and perfect nursing skills before contact with clients. These courses require an extensive use of equipment and supplies from the college Learning Resource Center. Accordingly, students are assessed a fee for the following courses: NUR 341, 342, 381, 382, 441, 442, and 481. Consult with an advisor for information on laboratory fees for Nursing courses. Lab fees may be assessed on other courses. See the current *Schedule of Classes*.

SPECIAL PROGRAMS

Honors Program. The Nursing Honors Program provides opportunities for academically talented nursing students to engage in educational enrichment opportunities. The program focuses on students in the professional program; however, opportunities are available in lower-division courses. For students pursuing upper-division honors work, this enriched learning experience begins in the junior year. Honors course work, consisting of at least 18 hours of upper-division honors credit, offers a challenging curriculum. Honors students are guided to complete honors credit in courses that complement their academic and career goals. Students interested in pursuing the Nursing Honors Program are encouraged to seek advising in the College of Nursing Student Services Office. Once admitted to the professional program, students receive advising from the honors coordinator.

For more information, call 480/965-2987 or stop by the Student Services Office at NUR 108. Interested students should also call the Barrett Honors College at 480/965-2359.

ASU West. ASU West hosts the professional program courses. To be eligible to enroll in the professional courses at ASU West, students must be admitted to the College of Nursing at ASU Main, submit all required material for admission to the professional program, and be admitted to the College of Nursing undergraduate professional program.

Continuing and Extended Education Program. The Continuing and Extended Education Program presents a variety of credit and noncredit offerings at ASU campuses and other off-campus locations. Instruction is also available via the Internet, CD-ROM, and other technology-based means. These offerings are designed to assist practicing professional nurses in maintaining and enhancing their competencies, to broaden their scientific knowledge base, and to improve their skills in adapting to the changing health care environment. Programs are organized in response to both the health care needs of the population and the learning needs of nurses engaged in a variety of professional roles and clinical specialties. Some offerings are multidisciplinary and are open to non-RNs. The program also delivers on-site education. For descriptions of continuing and extended education offerings, call the Continuing and Extended Education Program, College of Nursing, at 480/965-7431, send e-mail to concep@asu.edu, or access the program's Web site at www.asu.edu/nursing/ce.

Community Health Services. The College of Nursing administers a Community Health Services Clinic located in

Scottsdale, Arizona. Nurse practitioners provide primary care with an emphasis on promotion of wellness to families and individuals of all ages. Students in the College of Nursing may receive health care through the clinic for a fee. Students may obtain the health examinations and immunizations required for admission to the professional program at the clinic's facility. The facility also serves as a learning laboratory for both master's and baccalaureate nursing students.

GENERAL INFORMATION

Student Services. The Student Services Office in the College of Nursing provides academic advising, general advising, and referral to university resources. The staff of the Student Services Office is available to help students with a variety of concerns related to academic or personal issues. Prospective students wanting more information on College of Nursing programs or wanting to schedule an advising appointment should contact the College of Nursing Student Services Office at 480/965-2987.



Student learning a computer-simulated method of locating and inserting IV needles. Feedback from the machine allows students to learn without discomfort to human subjects.

Tim Trumble photo

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Scholarship and Financial Aid. For information regarding scholarships and loans, see "Financial Aid," page 48. Information about scholarship and loan funds for nursing students may be obtained from the Student Financial Assistance Office or the College of Nursing Student Services Office.

Learning Resources. The Learning Resource Center (LRC) contains a clinical simulation laboratory, audiovisual media, a variety of computers, and computer software related to nursing and health care. The LRC is staffed for student use during regular semester schedules.

Clinical Facilities. Learning experiences with patients/clients and families are provided under the supervision of qualified faculty in cooperation with a variety of federal, state, county, private health, and other agencies. The College of Nursing has contracts with over 250 agencies to provide clinical and practicum experience for Nursing students, operates its own unique nurse-managed clinic in a community setting, and offers experiences in a variety of other nurse-managed health services facilities. Various clinical laboratory facilities are available to students in this essential component of the program.

Student Activities. All ASU students are members of the Associated Students of ASU (ASASU) and participate in campus activities of interest to them. The student government of the university, ASASU, has a strong presence and offers a variety of services and activities. It is the official representative of the student body in matters of governance and budgeting.

College Council of Nursing Students. The College Council of Nursing Students (CCNS) is a member of ASASU and serves as the governing body of all student activities in the college. The council acts as a liaison between the Graduate Nurse Organization (GNO), the Student Nurses' Association (SNA), and the Nursing Students for Ethnic and Cultural Diversity. The CCNS provides for communication, cooperation, and understanding among undergraduate students, graduate students, and faculty and represents the college in university and nonuniversity affairs.

Graduate Nurse Organization. GNO is the coordinating body for nursing students in the graduate program. It provides programs, information, and orientation services for graduate students and complements their academic experiences.

Student Nurses' Association. SNA is a professional nursing organization. By being a member of SNA, the student belongs to the National Student Nurses' Association (NSNA), which is the student counterpart of the American Nurses Association for RNs. NSNA provides means for financial assistance, career planning, a voice in Washington, an opportunity for involvement, and low-cost comprehensive malpractice insurance.

Nursing Students for Ethnic and Cultural Diversity. This organization was formed in 1989 to provide a network of information and support for students interested in issues of cultural awareness and diversity.

Sigma Theta Tau International. The Beta Upsilon chapter of Sigma Theta Tau International (STT) was chartered at

the College of Nursing in 1976. Membership in STT is an honor conferred on undergraduate and graduate students who have demonstrated outstanding academic and professional achievement.

ROTC Program. Students pursuing a commission through either the Air Force or Army ROTC programs are required to take from 12 to 20 hours in the Department of Military Science. To preclude excessive course overloads, these students should plan on an additional one to two semesters and/or summer school to complete degree requirements. ROTC students must meet all of the degree requirements of the college.

College of Nursing

Barbara A. Durand

Dean

(NUR 322) 480/965-3244

www.asu.edu/nursing

PROFESSORS

DURAND, GALE, KIDD, PERRY, THURBER

ASSOCIATE PROFESSORS

ADAMS, ALPERS, BAGWELL, BRILLHART, CESAROTTI, DIRKSEN, ISMEURT, KILLEEN, KOMNENICH, MATTSON, MCCARTHY, PRIMAS, RODRIGUEZ

ASSISTANT PROFESSORS

LONG, McGRATH, PICKENS, SEHESTED, SOUSA, ZUNKEL

CLINICAL ASSOCIATE PROFESSORS

BECK, BELL, FARGOTSTEIN, HAGLER, JASPER, KASTENBAUM, MORRIS, STILLWELL, WHITE

CLINICAL ASSISTANT PROFESSORS

P. JOHNSON, W. JOHNSON, NUNEZ, SAYLES, SHEARMAN, WOTRING

INSTRUCTORS

ROSDAHL, SHEARER

COMMUNITY HEALTH PRACTICE (CHP)

See the *Graduate Catalog* for the CHP courses.

HEALTH CARE RELATED (HCR)

HCR 210 Clinical Health Care Ethics. (3)

fall, spring, summer

Health care ethics emphasizing analysis and ethical decision making at clinical and health policy levels for health care professionals. Prerequisites: ENG 101, 102.

General Studies: HU

HCR 220 Health Care Organizations. (3)

fall and spring

Overview of United States health care delivery systems; financing, health policy, basic principles of budgeting, cost-benefit analysis, and resource management. Cross-listed as HSA 220. Credit is allowed for only HCR 220 or HSA 220. Prerequisites: ENG 101 (or 105), 102.

General Studies: L

HCR 230 Culture and Health. (3)*fall and spring*

Cultures of diverse groups and health/illness. Cross-cultural communication, awareness of own cultural influences, indigenous and alternative healing practices.

General Studies: C, G

HCR 240 Human Pathophysiology. (4)*fall and spring*

Chemical, biologic, biochemical, and psychological processes used in study of structural and functional alterations in health with selected therapeutics. Prerequisites: BIO 201 and 202 and MIC 205 and 206 (or their equivalents).

NURSING (NUR)**NUR 314 Health Assessment for Registered Nurses. (3)***summer*

Introductory knowledge and skills for systematic physical, psychosocial, and developmental nursing assessment over the life span. 2 hours lecture, 3 hours lab. Fee. Prerequisite: RN status.

NUR 341 Theory I: Health Integrity. (4)*fall and spring*

Concepts related to health integrity with focus on individual clients. Fee. Prerequisite: admission to professional Nursing program. Pre- or corequisites: NUR 351, 361, 381.

NUR 342 Theory II: Health Integrity and Alterations. (5)*fall and spring*

Concepts related to selected alterations in health integrity with focus on individuals, families, and groups. Fee. Prerequisite: Junior I courses. Pre- or corequisites: NUR 362, 382.

NUR 351 Pharmacology in Nursing. (3)*fall and spring*

Foundations of pharmacological interventions. Prerequisite: admission to professional Nursing program.

NUR 361 Professional Development I. (2)*fall and spring*

Introduction to professional nursing roles and responsibilities. Prerequisite: admission to professional Nursing program.

NUR 362 Professional Development II: Nursing Research. (3)*fall and spring*

Introduction to concepts and issues in nursing research. Emphasis on quantitative and qualitative research processes, examination of nursing research literature. Prerequisite: Junior I.

General Studies: L

NUR 381 Nursing Practice I. (7)*fall and spring*

Applies health assessment, nursing process, and basic skills to promote and maintain health integrity of individual clients. Lab, clinical experience. Fee. Prerequisite: admission to professional Nursing program. Pre- or corequisites: NUR 341, 351, 361.

NUR 382 Nursing Practice II. (8)*fall and spring*

Applies nursing process with selected individuals, families, and groups experiencing alterations in health integrity. Lab, clinical experience. Fee. Prerequisite: Junior I. Pre- or corequisites: NUR 342, 362.

NUR 391 Registered Nurse Mobility I: Professional Development. (3)*fall and spring*

Historical, philosophical, and theoretical bases for professional nursing practice. Enhancement of critical inquiry skills through exploration of selected issues. Prerequisite: admission to professional Nursing program.

General Studies: L

NUR 392 Registered Nurse Mobility II: Health and Wellness. (3)*fall and spring*

Concepts of health integrity and community-based practice and professional nursing roles. Prerequisite: NUR 391.

NUR 441 Theory III: Health Integrity and Alterations. (6)*fall and spring*

Concepts related to health integrity and alterations with focus on individuals, families, groups, aggregates, and communities. Fee. Prerequisite: Junior II. Pre- or corequisites: NUR 461, 481.

NUR 442 Theory IV: Health Integrity and Alterations. (3)*fall and spring*

Advanced concepts related to health integrity and alterations in that integrity with focus on selected client populations. Fee. Prerequisite: Senior I. Pre- or corequisites: NUR 443, 462, 482.

NUR 443 Theory V: Leadership and Management. (3)*fall and spring*

Selected theories and concepts of organizations, management, leadership with focus on nursing management and leadership in health care organizations. Prerequisite: Senior I. Pre- or corequisites: NUR 442, 462, 482.

NUR 450 School Nursing Practice. (3)*summer*

Role of the professional nurse in planning, implementation, and evaluation of the school health program. Prerequisite: RN license.

NUR 451 Health Assessment of the Child. (3)*summer*

Maintenance of good health in the school-aged child using health assessment and promotion techniques. Lecture, discussion, self study, demonstration. Prerequisite: RN license.

NUR 452 Nursing of Children with Developmental Disabilities. (3)*summer*

Congenital and acquired physical and mental developmental disorders, including the evaluation of child and family and community resources. Prerequisite: RN license.

NUR 461 Professional Development III: The Art of Nursing. (3)*fall and spring*

Explores the aesthetics, ethical, and personal patterns of knowing in nursing. Prerequisite: Junior II.

General Studies: HU

NUR 462 Professional Development IV. (2)*fall and spring*

Focuses on role transition to professional nursing. Prerequisite: Senior I.

NUR 481 Nursing Practice III. (7)*fall and spring*

Applies concepts and clinical practice related to health integrity and alterations with focus on individuals, families, groups, aggregates, communities. Lab, clinical experiences. Fee. Prerequisite: Junior II. Pre- or corequisites: NUR 441, 461.

NUR 482 Nursing Practice IV. (8)*fall and spring*

Capstone course with focus on synthesis and application of patterns of knowing and leadership, management concepts in collaborative nursing practice. Lab, clinical experiences. Prerequisite: Senior I. Pre- or corequisites: NUR 442, 443, 462.

NUR 494 Special Topics. (1-4)*fall, spring, summer*

Advanced study and/or supervised practice in an area of nursing. Lecture and lab to be arranged. Prerequisite: 12 hours in Nursing major or instructor approval.

NUR 495 Community Health/Home Health Nursing Practice. (4)*fall and spring*

Theoretical content related to community and home health care. Clinical practice with individual, family aggregates. 1 hour lecture, 3 hours lab. Prerequisite: NUR 392. Corequisite: NUR 362.

NUR 496 Leadership and Management Practice for RNs. (5)*fall and spring*

Capstone leadership and management experience for the RN student that utilizes patterns of knowing in nursing practice. Clinical lab. Prerequisites: NUR 362, 392, 443, 461. Corequisite: NUR 495.

NUR 500 Research Methods. (3)*fall and spring*

Research methods including research conceptualization and design in nursing. Prerequisites: admission to graduate Nursing program; graduate-level inferential statistics course.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

NUR 501 Advanced Adult Health Assessment/Promotion: Advanced Theory. (4)

fall

Expands adult health assessment/promotion skills through knowledge/strategies essential for developing and interpreting data. Lecture, demonstration. Prerequisite: all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 502 Management and Maintenance of Adults with Chronic Health Alterations: Advanced Theory. (4)

spring

Includes theory/research that guides the management/maintenance of adults with chronic health alterations. Emphasizes psychophysiological interrelationships of illnesses. Lecture, seminar. Prerequisites: NUR 501; all core and flexible core courses except thesis/project. Pre- or corequisite: NUR 580.

NUR 503 Management and Maintenance of Adults with Acute Health Alterations: Advanced Theory. (3)

spring

Emphasizes theoretical research foundations essential for advanced practice involving care of adults with acute episodic alterations in health. Lecture, seminar. Prerequisite: NUR 501. Pre- or corequisite: NUR 580.

NUR 521 Community Mental Health/Psychiatric Nursing: Advanced Mental Health Assessment. (3)

fall

Theories related to holistic health assessment for the promotion of physical/psychological health; develops skill in mental health assessments. Lecture, seminar, lab. Prerequisite: all core and flexible core courses except thesis/project.

NUR 522 Community Mental Health/Psychiatric Nursing: Advanced Theory I. (3)

fall

Analyzes issues, theories, and research in restoration and promotion of mental health. Emphasizes developing conceptual framework for psychiatric nursing. Prerequisites: NUR 521; all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 523 Community Mental Health/Psychiatric Nursing: Advanced Theory II. (3)

spring

Focuses on development of theoretical basis for intervention and a knowledge base for collaboration and consultation in the mental health area. Prerequisites: NUR 522; all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 524 Psychoneuroimmunology Approaches to Practice. (3)

summer

Overview of theories, concepts, and research in psychoneuroimmunology including physiological aspects and application to a holistic nursing model. Seminar. Prerequisite: admission to graduate Nursing program.

NUR 525 Neonatal/Pediatric Physiology/Embryology. (3)

fall

Prepares advanced practice nurses to use embryology, genetics, and physiology concepts within the nursing process in the care of pediatric and neonatal patients. Lecture, discussion, participative dialogues, case studies. Prerequisites: undergraduate anatomy and physiology courses.

NUR 526 Advanced Neonatal Physical Assessment. (4)

fall

Develops assessment skills related to neonate/infant, including history-taking, physical, developmental, behavioral, cultural, and genetics assessment to provide comprehensive advanced practice neonatal nursing care. Lecture, seminar, discussion, case studies. Prerequisite: instructor approval. Corequisite: NUR 525.

NUR 527 Neonatal and Pediatric Pharmacology in Nursing Practice. (3)

spring

Examines and discusses the rationale, action, and therapeutic effect for using each class of medications employed in neonatal and pediatric health care. Lecture, seminar, discussion, case studies, clinical. Pre- or corequisites: both NUR 525 and 526 (or 558) or only instructor approval.

NUR 528 Advanced Developmental and Family-Centered Nursing Care. (4)

spring

Provides the foundation for providing advanced nursing care of children that is developmentally supportive, family-centered, and culturally competent. Lecture, seminar, discussion, skills laboratory, clinical. Pre- or corequisites: both NUR 525 and 526 (or 558) or only instructor approval.

NUR 531 Nursing of Children: Advanced Theory I. (3)

fall

Focuses on current practices, research, and issues related to health promotion and disease prevention for children and adolescents. Lecture, seminar. Prerequisite: all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 532 Nursing of Children: Advanced Theory II. (3)

spring

Focuses on concepts, theories, and research as a basis for strategies related to management of illness and health maintenance for children. Lecture, seminar. Prerequisites: NUR 531; all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 533 Nursing of Children with Special Needs: Advanced Theory. (3)

spring

Focuses on concepts, theories, and research related to acute and chronic health deviations of children. Lecture, seminar. Prerequisites: NUR 531 (or instructor approval); all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 534 Women's Health: Advanced Theory I. (4)

fall

Focuses on theories, principles, and research related to managing the health of normal perinatal women and families. Cooperative learning strategies. Prerequisite: all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 535 Women's Health: Advanced Theory II. (4)

spring

Focuses on management of nursing care for high-risk perinatal women and women with common health problems. Cooperative learning strategies. Prerequisites: NUR 534; all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 551 Theoretical Foundations of Advanced Practice Nursing. (3)

fall and spring

Facilitates student exploration and examination of the foundations of advanced nursing practice. Lecture, seminar. Prerequisite: admission to graduate Nursing program.

NUR 552 Health Care Issues and Systems. (3)

fall and spring

Analyzes organization, financing, service delivery and outcomes of the health system. Emphasizes policy issues, roles, and challenges for nurses. Lecture, seminar. Prerequisite: admission to graduate Nursing program.

NUR 553 Life Span Development. (3)

fall

Critical examination of concepts, theories, issues, and research related to developmental periods throughout the life span. Analyzes biological and health, cognitive, psychological, and sociocultural influences. Lecture, discussion. Prerequisite: admission to graduate Nursing program.

NUR 554 Population-Based Health Care. (3)

fall and spring

Identification and assessment of specific community health needs and health care patterns of target populations. Addresses promotion, protection, and improvement of health when planning health care services. Lecture, seminar. Prerequisite: admission to graduate Nursing program.

NUR 558 Advanced Pediatric Health Assessment. (3)

spring

Expansion of basic health assessment skills and development of clinical problem-solving skills for advanced practice nurses. Includes assessments of infants, children, and adolescents. Lecture, lab. Prerequisites: admission to graduate Nursing program; undergraduate health assessment within the last five years.

NUR 559 Advanced Health Assessment. (3)*spring*

Expansion of basic health assessment skills and development of clinical problem-solving skills for advanced practice nurses. Includes assessments of infants, children, adolescents, and adults. Lecture, lab. Fee. Prerequisites: admission to graduate Nursing program; undergraduate health assessment within the last five years.

NUR 561 Advanced Practice Nursing Role. (2)*summer*

Focuses on the examination and implementation of the role of the advanced practice nurse, emphasizing major components and sub-components of the role. Lecture, seminar. Prerequisite: admission to graduate Nursing program or instructor approval.

NUR 562 Family Nurse Practitioner Advanced Theory I: Health Promotion, Management, and Maintenance. (4)*fall*

First didactic role specialty course. Focuses on concepts and strategies to promote, manage, and maintain health of child, adult, and family. Prerequisite: all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 563 Family Nurse Practitioner Advanced Theory II: Health Promotion, Management, and Maintenance. (4)*spring*

Second didactic role specialty course utilizing knowledge from previous courses to formulate therapeutic promotion, management, and maintenance for individuals across the life span. Prerequisites: NUR 562; all core and flexible core courses except thesis/project. Corequisite: NUR 580.

NUR 564 Applied Pharmacotherapeutics for Advanced Practice. (3)*spring*

Life span course for advanced nurse practitioners to expand knowledge of pharmacotherapeutic concepts and principles. Lecture, discussion, case studies. Prerequisite: admission to graduate Nursing program.

NUR 565 Applied Physiology/Pathophysiology in Advanced Practice. (3)*spring*

Advanced nurse practitioner course designed to expand previously acquired anatomy and physiology knowledge and discern pathological alterations across the life span. Lecture, seminar, case studies. Prerequisites: admission to graduate Nursing program; undergraduate anatomy and physiology.

NUR 566 Pediatric Physiology/Pathophysiology. (3)*spring*

Analyzes the patterns of heredity, cellular differentiation, and the development of systems in the infant to adolescent. Prerequisite: admission to graduate Nursing program.

NUR 571 Teaching in Nursing Programs. (3)*not regularly offered*

Analyzes theories, issues, and research related to teaching in nursing. Focuses on the process of teaching/learning. Seminar, cooperative learning. Prerequisite: graduate standing.

NUR 578 Gestalt Therapy I. (3)*fall*

Introduction to theory and methodology of Gestalt therapy and its uses for mental health promotion and restoration.

NUR 579 Gestalt Therapy II. (3)*spring*

Focuses on further development of Gestalt therapy and its application in working with various client populations. Prerequisite: NUR 578.

NUR 580 Practicum (Electives). (1-4)*not regularly offered*

Clinical application of theories, concepts, and principles such as health promotion, health management, health maintenance, teaching, management, and special clinical studies. Fee.

NUR 580 Advanced Nursing Practicum I, II. (1-12)*fall and spring*

Clinical application of theories, concepts, and principles in areas of concentration. Conferences. Possible topics:

- Adult Health Nursing. (2-6)
- Community Health Nursing. (2-6)
- Community Mental Health/Psychiatric Nursing. (2-6)
- Family Health Nursing. (2-6)
- Parent-Child Nursing with the Tracks of the Childbearing Family and Nursing of Children. (2-6)
- Women's Health Nursing. (2-6)

Prerequisite: admission to graduate Nursing program. Corequisite: NUR 501 or 502 or 503 or 522 or 523 or 531 or 532 or 533 or 534 or 535 or 562 or 563.

NUR 582 Advanced Human Physiology. (3)*fall*

Analyzes major theories and concepts of human physiology. Explores interrelationship of physiology and health. Prerequisite: admission to graduate Nursing program.

NUR 584 Community Health Nursing Internship. (3)*spring*

Students operationalize community health nursing/public health content in leadership roles in a variety of community agencies. Clinical internship. Prerequisite: NUR 580.

NUR 585 Stress Reduction. (3)*not regularly offered*

Theory, application, and evaluation of mind/body relaxation methods, including physiological effects. Emphasizes research findings. Daily student practice. Prerequisite: graduate standing or instructor approval.

NUR 586 Advanced Pathophysiology. (3)*spring*

Manifestation of altered human physiology and disease. Uses systems theory to analyze the relationships of disease and physiology. Prerequisites: NUR 582; admission to graduate Nursing program.

NUR 589 Research Utilization. (3)*fall and spring*

Emphasizes the synthesis and application of research to an identified clinical nursing problem. Prerequisite: all core and flexible core courses except thesis/project. Corequisite: NUR 593.

NUR 591 Seminar. (2-4)*not regularly offered*

Advanced topics, including curriculum development and health promotion. Prerequisite: instructor approval in selected courses.

NUR 593 Applied Project. (1)*fall and spring*

Preparation of a supervised applied project that is a graduation requirement in some professional majors. Prerequisite: all core and flexible core courses. Corequisite: NUR 589.

NUR 598 Special Topics. (1-4)*not regularly offered*

Special study, including issues in health care and organizations, management in nursing, ethical issues, and clinical nurse specialist role. Possible topics:

- Advanced Neonatal Theory I. (4)
fall
Fee.
- Advanced Neonatal Theory II. (3)
spring
- Epidemiology. (2)
- Nursing of Children with Development Disabilities. (3)
- School Nursing Practice. (3)

NUR 599 Thesis. (1-6)*fall, spring, summer*

Research proposal development, data collection and analysis, thesis writing, and thesis oral defense. Six hours required. Prerequisite: all core and flexible core courses.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

College of Public Programs

Anne L. Schneider, Ph.D., Dean

www.asu.edu/copp



Hugh Downs, for whom the School of Human Communication is named

Tim Trumble photo

American Indian Studies Program	470
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PURPOSE

The faculty in the College of Public Programs offer a wide range of undergraduate and graduate course work, both on and off campus, to full- and part-time students. Each academic unit of the college not only assumes responsibility in preparing its own majors, but provides a variety of service courses for the rest of the university. The college is committed to providing excellence in teaching, research, and public service. Consequently, the units work closely with numerous public, quasi-public, and private agencies at the national, regional, state, and local levels.

ORGANIZATION

The College of Public Programs is composed of eight academic units, each administered by a chair or director:

- American Indian Studies Program
- Asian Pacific American Studies Program
- Department of Recreation Management and Tourism
- Hugh Downs School of Human Communication
- School of Justice Studies
- School of Public Affairs
- School of Social Work
- Walter Cronkite School of Journalism and Telecommunication

The general administration of the college is the responsibility of the dean, who is responsible to the university president through the senior vice president and provost. For more information, visit the college's Web site at www.asu.edu/copp.

ADMISSION

Freshmen and Transfers. Individuals interested in admission to an undergraduate program in the College of Public Programs should refer to "Undergraduate Admission," page 54. Those who meet the minimum university admission requirements will be admitted to the undergraduate academic unit of the college as a *premajor* in that respective academic unit.

Major Status Admission Requirements. Entry to any undergraduate academic unit of the college with status as a major requires

1. the completion of at least 56 semester hours with a minimum cumulative GPA of 2.50;
2. the university First-Year Composition requirement and the university mathematical studies requirement (see "University Graduation Requirements," page 74); and
3. the College of Public Programs writing competence, communication, and computer requirements (see "College Degree Requirements," page 468).

The academic units may also have additional requirements. The ASU GPA is computed on ASU courses only and must be based on a *minimum* of nine semester hours of courses with grade options of “A,” “B,” “C,” “D,” or “E.”

Most upper-division courses in the college are not open to premajors. Premajors should check the catalog information in their major fields to determine any course enrollment restrictions.

Students should refer to the section of the catalog and advising documents with reference to their preferred areas of study for specialized departmental retention requirements and/or continued enrollment in their major courses.

Transfer Credit. In most cases, course work successfully completed at a regionally accredited four-year institution of higher education is accepted into the respective academic unit.

Transferable course work successfully completed at an accredited two-year institution of higher education (community or junior college) transfers as lower-division credit up to a maximum of 64 semester hours.

Successful completion is defined for purpose of transfer as having received a grade comparable to an “A,” “B,” or “C” at ASU. The acceptance of credits is determined by the director of Undergraduate Admissions, and the utilization of credits toward degree requirements is at the discretion of the academic unit.

ADVISING

The advising mission for the College of Public Programs professional academic advising staff is to assist students in developing meaningful educational plans to meet their academic, career, and personal goals in an ongoing process of evaluation and clarification.

The advisors strive to perform their duties in a professional, ethical, confidential, accurate, and supportive manner, respecting student diversity and needs, and always holding the individual in highest regard. The student and advisor should accomplish this process in a spirit of shared responsibility to develop academic excellence, strong decision-making skills, and self-reliance.

A student who has been admitted to the College of Public Programs is assigned an academic advisor from the academic unit of the student’s major area of study. Questions on advising should be directed to the student’s academic

advisor or to the College Student Services Office, WILSN 203.

Mandatory Advising. The following categories of students are required to receive advising and to be cleared on the Mandatory Advising Computer System before they may register for classes:

1. students with admissions competency deficiencies;
2. all freshmen;
3. transfer students in their first semester at ASU;
4. readmitted students;
5. students on probation;
6. students who have been disqualified;
7. students with special admissions status; and
8. all Social Work undergraduate majors.

Course Load. A normal course load per semester is 15 to 16 semester hours. The maximum number of hours for which a student can register is 18 semester hours unless an overload petition has been filed and approved by the Department/School Standards Committee and the Academic and Student Affairs Committee of the college. Semester course loads may be further limited for students in mandatory advising.

Petitions for overload are not ordinarily approved for students who have a cumulative GPA less than 3.00 and who do not state valid reasons for the need to register for the credits. Students who register for semester hours in excess of 18 and do not have an approved overload petition on file have courses randomly removed through an “administrative drop” action.

Specific degree requirements are explained in detail under the respective college, school, and department sections.

DEGREES

The faculty in the College of Public Programs offer undergraduate academic instruction in five departments or schools. Successful completion of a four-year program of 120 semester hours is specified by the respective academic unit. See “College of Public Programs Baccalaureate Degrees and Majors” table, on this page.

College of Public Programs Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
American Indian Studies	B.S.	—	American Indian Studies Program
Broadcasting	B.A.	Broadcast journalism, business/management	Walter Cronkite School of Journalism and Telecommunication
Communication	B.A., B.S.	—	Hugh Downs School of Human Communication
Journalism	B.A.	News editorial, public relations, visual journalism	Walter Cronkite School of Journalism and Telecommunication
Justice Studies	B.S.	—	School of Justice Studies
Recreation	B.S.	Recreation management, tourism	Department of Recreation Management and Tourism
Social Work	B.S.W.	—	School of Social Work

GRADUATE PROGRAMS

Master's degree programs are offered by all of the academic units of the College of Public Programs, and four of the units offer doctoral degrees. See the "College of Public Programs Graduate Degrees and Majors" table, page 469.

For more information on courses, faculty, and programs, see the *Graduate Catalog*.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see "ASU Extended Campus," page 683, or access the Web site at www.asu.edu/xed.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements.

First-Year Composition Requirement

Students must demonstrate reasonable proficiency in written English by achieving a grade of "C" or higher in both ENG 101 and 102 (or ENG 107 and 108 for international students), or in ENG 105 or its equivalent. Should a student receive a grade lower than "C" in any of the courses, it must be repeated until the specified proficiency is demonstrated. Composition courses transferred from out-of-state institutions must be evaluated and approved by the Writing Programs Office.

General Studies Requirement

All undergraduate students in the College of Public Programs are required to complete the university General Studies requirement to be eligible for graduation in any of the undergraduate curricula offered by the college.

General Studies courses are regularly reviewed. To determine whether a course meets one or more parts of the General Studies requirement, see "General Studies," page 78, and the current *Schedule of Classes*. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

General Studies courses are also identified following course descriptions according to the "Key to General Studies Credit Abbreviations," page 80.

College Degree Requirements

In addition to the university General Studies requirement, the College of Public Programs has requirements in communication, computer science, and writing competence.

Communication Requirement. All undergraduate majors are required to take one of the following courses:

COM 100 Introduction to Human Communication <i>SB</i>	3
COM 225 Public Speaking <i>L</i>	3
COM 230 Small Group Communication <i>SB</i>	3
COM 241 Introduction to Oral Interpretation <i>L/HU</i>	3
COM 259 Communication in Business and the Professions	3

These courses present an overview of human communication and help the student to develop oral presentation skills and competence. The course may be included within the university General Studies requirement, the College of Public Programs requirements, or the department/school degree program, where appropriate. Journalism and Broadcasting majors are limited to COM 225 or 241. Recreation majors are limited to COM 225, 241, or 259.

Computer Requirement

A computer course is required for all undergraduate majors. Any computer (CS) course from the university General Studies list is acceptable. It may be included within the numeracy requirement or department or school degree program, where appropriate.

Non-English Language Requirement

The Walter Cronkite School of Journalism and Telecommunication requires proficiency in a language other than English for majors in Journalism and Broadcasting. Communication majors have the choice of demonstrating proficiency in a language other than English under the B.A. Proficiency is defined as completing the second semester intermediate level, or higher, of a language other than English.

Writing Competence Requirement

In addition to ENG 101 and 102 First-Year Composition or their equivalent, one of the following courses in advanced written expository composition is required of all undergraduate majors:

BUS 301 Fundamentals of Management Communication <i>L</i>	3
ENG 215 Strategies of Academic Writing <i>L</i>	3
ENG 216 Persuasive Writing on Public Issues <i>L</i>	3
ENG 217 Writing Reflective Essays <i>L</i>	3
ENG 218 Writing About Literature <i>L</i>	3
ENG 301 Writing for the Professions <i>L</i>	3
JRN 201 Journalism Newswriting <i>L</i>	3
TCM 201 Radio-Television Writing <i>L</i>	3

The writing competence course may be counted as fulfilling the university General Studies literacy and critical inquiry (L) requirement if it is on the university-approved list.

Pass/Fail Option

The College of Public Programs does not offer any courses for pass/fail credit. Courses completed for pass/fail credit outside the College of Public Programs may count only as elective credit in meeting degree requirements.

Limit on Physical Education Activity Hours

No more than eight hours of physical education activity courses may be counted within the minimum 120 hours required for graduation.

College of Public Programs Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Communication	M.A.	—	Hugh Downs School of Human Communication
	Ph.D.	Communicative development, intercultural communication, organizational communication	Hugh Downs School of Human Communication
Justice Studies	M.S.	—	School of Justice Studies
	Ph.D.*	Criminal and juvenile justice; dispute resolution; law, justice, and minority populations; law, policy, and evaluation; women, law, and justice	Committee on Law and Social Sciences
Mass Communication	M.M.C.	—	Walter Cronkite School of Journalism and Telecommunication
Public Administration	M.P.A.	Public information management, public management, public policy analysis and evaluation, urban management and planning	School of Public Affairs
	D.P.A.	—	School of Public Affairs
Recreation	M.S.	—	Department of Recreation Management and Tourism
Social Work	M.S.W.	Advanced direct practice; planning, administration, and community practice	School of Social Work
	Ph.D.	—	School of Social Work

* This program is administered by the Graduate College.

MAJOR REQUIREMENTS

Students should refer to the respective department or school section of the catalog and to department or school advising documents for more information on requirements.

Undergraduate Credit for Graduate Courses. To enable undergraduate students to enrich their academic development, the Graduate College and the individual academic units of the College of Public Programs allow qualified students to take graduate-level courses for undergraduate credit. To qualify for admission to a graduate-level course, the student must have senior status (87 or more semester hours successfully completed) and a cumulative GPA of 3.00 or higher. In addition, permission to enroll must be given before registration and must be approved by the instructor of the course, the student's advisor, the department chair or school director, and the dean of the college in which the course is offered.

ACADEMIC STANDARDS AND RETENTION

Good Standing. Any premajor or major student of the respective academic units of the college is considered in good standing for the purpose of retention if the student maintains a cumulative GPA of 2.00 or higher in all courses taken at ASU. However, to achieve major status in the undergraduate degree programs in the college, students must have a cumulative GPA of 2.50 or higher at ASU.

Probation. Any student who does not maintain good standing status is placed on probation. A student on academic

probation is required to observe any limitations or rules the college may impose as a condition for retention.

Disqualification. A student who is on probation becomes disqualified if (1) the student has not returned to good standing or (2) the student has not met the required semester GPA.

Disqualification is exercised at the discretion of the college and becomes effective on the first day of the fall or spring semester following college action. A disqualified student is notified by the Office of the Registrar and/or the dean of the college and is not allowed to register for a fall or spring semester at the university until reinstated. A student who is disqualified may not attend as a nondegree student.

Reinstatement. Students seeking reinstatement after disqualification should contact the College Student Services Office regarding procedures and guidance for returning to good standing. When reinstatement includes readmission, application must be made to the Readmissions Section of the Office of the Registrar.

All academic discipline action is the function of the College Student Services Office, WILSN 203, under the direction of the dean of the college. Students having academic problems should call this office for advising at 480/965-1034.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

SPECIAL PROGRAMS

Craig and Barbara Barrett Honors College

The College of Public Programs cooperates with the Barrett Honors College, which affords superior undergraduates opportunities for special classes taught by selected faculty. Honors students receive special advising and priority pre-registration and complete a senior honors thesis. Participating students can major in any academic program. A full description of the requirements and the opportunities offered by the Barrett Honors College can be found in the "The Craig and Barbara Barrett Honors College" section, page 112.

For more information, visit the College of Public Programs Student Services Office at WILSN 203, or call 480/965-1058. For more information about the Barrett Honors College, call 480/965-2359.

College of Public Programs Council

The College of Public Programs Council is a unit of Associated Students of Arizona State University and serves as the coordinating body of student activities in the college. The council fosters communication, cooperation, and understanding among undergraduate students, graduate students, faculty, and staff. As the official representative student organization to the dean and college administration, the council appoints student members to faculty committees, cosponsors events with the college alumni association, and represents students at college and university functions.

Center for Nonprofit Leadership and Management

The mission of the Center for Nonprofit Leadership and Management is "to improve the quality of life in communities by enhancing the performance of nonprofit organizations." Varied strategies accomplish this mission and include coordination of educational offerings, selected technical assistance to nonprofits, support for research projects for faculty and students, and the convening of nonprofit leaders and managers through a variety of training opportunities. The center supports the activities of three complementary nonprofit management education programs: the Nonprofit/Youth Agency Administration: American Humanics Certificate (undergraduate), the Nonprofit Management Certificate (extended education), and the Nonprofit Leadership and Management Certificate (graduate). For more information, call 480/965-0607.

Center for Urban Inquiry

The Center for Urban Inquiry focuses on civic involvement. The center's mission is to examine the unique features of the new urban West in the United States, particularly intersections of growth and development with citizen activism and community building. By harnessing the unique resources of the university, the center engages in partnerships with urban citizens, including youths, to increase awareness, promote inclusion, and address needs. Center programs include seed grants to students working in teams in pursuit of urban research and community service; service learning that involves students in community building; technical assistance to neighborhood organizations, schools, and hospitals; and the production of works that appeal broadly to urban audiences, including performances, exhibits, and videos.

For more information, call 480/965-9216, or access the Web site at www.asu.edu/copp/urban.

College of Public Programs

The academic units within the College of Public Programs may use the CPP prefix for course offerings that cross disciplinary boundaries.

COLLEGE OF PUBLIC PROGRAMS (CPP)

CPP 194 Special Topics. (1-4)
not regularly offered

CPP 294 Special Topics. (1-4)
not regularly offered

CPP 394 Special Topics. (1-4)
not regularly offered

CPP 484 Internship. (1-12)
not regularly offered

CPP 494 Special Topics. (1-4)
not regularly offered

CPP 498 Pro-Seminar. (1-7)
not regularly offered

CPP 499 Individualized Instruction. (1-3)
not regularly offered

CPP 580 Practicum. (1-12)
not regularly offered

CPP 583 Field Work. (1-12)
not regularly offered

CPP 584 Internship. (1-12)
not regularly offered

CPP 590 Reading and Conference. (1-12)
not regularly offered

CPP 591 Seminar. (1-12)
not regularly offered

CPP 593 Applied Project. (1-12)
not regularly offered

CPP 594 Conference and Workshop. (1-12)
not regularly offered

CPP 598 Special Topics. (1-4)
not regularly offered

CPP 690 Reading and Conference. (1-12)
not regularly offered

CPP 691 Seminar. (1-12)
not regularly offered

American Indian Studies Program

Carol C. Lujan

Director

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www.asu.edu/copp/americanindian

ASSOCIATE PROFESSOR

LUJAN

ASSISTANT PROFESSOR

MILLER

The American Indian Studies Program emphasizes the political and cultural experience of the various American Indian peoples of the United States. Course work focuses on the cultures, arts, history, and contemporary experiences of the various American Indian nations. The curriculum also concentrates on the practical application for professional career development, preparation for advanced degree programs, and preparation for service to Indian governments

and reservations. It emphasizes scholarly expertise in selected fields of study and its practical application to community service.

AMERICAN INDIAN STUDIES—B.S.

Students pursuing a B.S. degree in American Indian Studies gain a broad knowledge of American Indian nations and peoples, with particular emphasis on Southwest American Indian nations. The degree program offers courses that provide students with intellectual and practical knowledge pertaining to American Indian cultures, history, law, literature, language, art, and government.

Students are required to take 42 semester hours, including 24 hours of required courses and 18 hours in one of two areas of emphasis: (1) legal policy, community, and economic development; or (2) arts, languages, and cultures. Contact the program office for a current listing of elective courses. The following courses are required for all students majoring in American Indian Studies.

AIS 180	Introduction to American Indian Studies C	.....3
AIS 280	American Indian Law and Society C	.....3
AIS 370	American Indian Languages and Cultures	.....3
AIS 380	Contemporary Issues of American Indian Nations	.....3
AIS 385	Federal Indian Policy	.....3
AIS 394	ST: Basic Statistical Analysis*	.....3
AIS 420	American Indian Studies Research Methods	.....3
AIS 498	Pro-Seminar in American Indian Studies	.....3

* Until American Indian Studies is able to offer its own course in statistical research methods, students must take JUS 302 or a comparable course, in consultation with an advisor.

The minor in American Indian Studies is designed for students interested in developing an understanding of American Indian issues and analyzing issues through critical inquiry. Fifteen semester hours are required, including AIS 180, 380, and 385 and six elective semester hours from the two areas of emphasis. No pass/fail or credit/noncredit course work may be applied to the minor. A minimum of nine hours must be in resident credit at ASU Main. Students must receive a minimum grade of “C” for all courses in the minor and meet all course eligibility requirements.

CERTIFICATE IN AMERICAN INDIAN STUDIES

The certificate program recognizes the need for training American Indian and non-Indian students for employment and leadership roles in American Indian government, in state/federal agencies, in education programs, and in urban and Indian community programs.

To this end, the American Indian Studies Certificate program seeks to address the myriad of contemporary social, political, and economic problems and issues impacting American Indian people.

The program provides students with

1. useful knowledge pertaining to American Indian sovereignty, government, law, history, economic development, and culture;
2. practical experience in the form of an internship working in an American Indian government, a com-

munity program, an educational entity, an urban program, or a state/federal agency; and

3. educational skills so that graduates can pursue jobs with an American Indian focus.

For more information, call the director of the American Indian Studies Program at 480/965-6977.

AMERICAN INDIAN STUDIES (AIS)

AIS 180 Introduction to American Indian Studies. (3)

once a year

Introduction to the study of American Indian justice issues from an interdisciplinary perspective. Primary topics include sovereignty, law, and culture.

General Studies: C

AIS 194 Special Topics. (1–4)

fall and spring

AIS 280 American Indian Law and Society. (3)

fall and spring

Examines the sovereign status of American Indians and legal relationships between the tribes and the U.S. government. Lecture, studio, televised presentation.

General Studies: C

AIS 294 Special Topics. (1–4)

not regularly offered

AIS 370 American Indian Languages and Cultures. (3)

fall

Emphasizes understanding of Indian language families and the relationship of oral traditions to culture. Prerequisite: AIS 180.

AIS 380 Contemporary Issues of American Indian Nations. (3)

spring

Survey of legal, socioeconomic, political, and educational state of contemporary reservation and urban Indians. Prerequisite: AIS 180.

AIS 385 Federal Indian Policy. (3)

spring

Historical overview of political and legal frameworks, executive policies, and judicial decisions in the context of Indian affairs. Prerequisite: AIS 180.

AIS 394 Special Topics. (1–4)

fall and spring

Possible topics:

- (a) American Indian World Views and Philosophies. (3)

AIS 420 American Indian Studies Research Methods. (3)

fall

Survey of diverse research methods, including statistical, historical, interpretative, and narrative approaches. Prerequisite: AIS 180.

AIS 484 Internship. (1–12)

not regularly offered

AIS 494 Special Topics. (1–4)

fall and spring

AIS 498 Pro-Seminar. (1–7)

not regularly offered

AIS 499 Individualized Instruction. (1–3)

not regularly offered

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Asian Pacific American Studies Program

Thomas K. Nakayama
Director
 (AG 352) 480/965-9711
 Fax 480/727-7911
 www.asu.edu/copp/asianamerican

PROFESSOR
 NAKAYAMA

ASSISTANT PROFESSORS
 de JESÚS, ROSA

PURPOSE

Asian Pacific American Studies is an interdisciplinary undergraduate program that examines the experiences of Asian Americans and Pacific Islanders within the United States, particularly in the Southwest. The program is designed to help students of all ethnicities to

1. appreciate the diversity of Asian American and Pacific Islander cultures, experiences, and histories;
2. understand the U.S. experience in new ways; and
3. participate more effectively in an increasingly diverse society.

A certificate program offers courses that provide students with opportunities to think critically about interethnic cooperation and conflict. The program integrates teaching, research, and community service.

Certificate in Asian Pacific American Studies

Course Requirements. The certificate program requires 18 semester hours. Twelve core hours must be fulfilled by the following courses:

APA 200 Introduction to Asian Pacific American Studies <i>HU/SB, C</i>	3
APA 360 Asian Pacific American Experience <i>HU/SB, C</i>	3
APA 450 Asian Pacific American Contemporary Issues <i>SB, C</i>	3
APA 484 Internship	3

The remaining six semester hours must be filled by courses from an approved list, including any additional courses with an APA prefix, as well as ASB 242, COM 263, MCO 460, and SOC 470.

Students must apply for the certificate program through the Asian Pacific American Studies Program office.

For more information, call the program director at 480/965-9711.

ASIAN PACIFIC AMERICAN STUDIES (APA)

APA 194 Special Topics. (1–4)
fall and spring

APA 200 Introduction to Asian Pacific American Studies. (3)
fall and spring

Examination of historical and contemporary issues facing Asian Americans and Pacific Islanders in the United States. Lecture, discussion.
General Studies: HU/SB, C

APA 210 Introduction to Ethnic Studies in the U.S. (3)

fall and spring

Covers diversity of experiences and relations among racial and ethnic groups in the United States. Lecture, discussion. Cross-listed as AFH 210/CCS 210. Credit is allowed for only AFH 210 or APA 210 or CCS 210.

General Studies: C

APA 294 Special Topics. (1–4)

fall and spring

Open to all students. May be repeated for credit. Possible topics:

- (a) Introduction to Ethnic Studies

APA 310 Asian Pacific American Arts and Cultures. (3)

fall and spring

Exploration of Asian Pacific American cultural expression in art, literature, film, theatre, dance, and music. Lecture, discussion.

General Studies: HU, C

APA 315 Asian Pacific American Literature. (3)

fall

Exploration of the literary history, critical reception, and major theories in Asian Pacific American poetry, fiction, and prose. Lecture, discussion.

General Studies: HU, C

APA 340 Asian Pacific Americans and Media. (3)

fall

Analysis of social construction of Asian Pacific American media images and resistance to those images in various historical contexts. Lecture, discussion.

General Studies: HU, C

APA 360 Asian Pacific American Experience. (3)

fall and spring

Historical and contemporary experiences of an Asian Pacific American racial/ethnic group in the United States. Lecture, discussion. Possible topics:

- (a) Chinese
- (b) Filipino
- (c) Japanese
- (d) Korean
- (e) Pacific Islander
- (f) South Asian
- (g) Southeast Asian

General Studies: HU/SB, C

APA 394 Special Topics. (1–4)

fall and spring

Open to all students. May be repeated for credit. Possible topics:

- (a) Asian Pacific American Immigration Issues
- (b) Asian Pacific American Legal History
- (c) Asian Pacific American Women Issues and Identities

APA 450 Asian Pacific American Contemporary Issues. (3)

fall and spring

Focus on issues shaping Asian Pacific American communities, including immigration, politics, education, health, family, gender, youth, inter-racial relations, and other contemporary topics. Lecture, discussion. Prerequisite: APA 200 or instructor approval.

General Studies: SB, C

APA 484 Internship. (1–12)

fall and spring

APA 494 Special Topics. (1–4)

fall and spring

Open to all students. May be repeated for credit. Possible topics:

- (a) Asian Pacific American Communities
- (b) Asian Pacific American Leadership
- (c) Voices and Visions: Asian Pacific American Women, Issues, and Identities

APA 498 Pro-Seminar. (1–7)

fall and spring

APA 499 Individualized Instruction. (1–3)

fall and spring

Hugh Downs School of Human Communication

Jess K. Alberts
Director
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com.pp.asu.edu

PROFESSORS

ALBERTS, ARNOLD, BROOME, CANARY,
CARLSON, JAIN, MARTIN, McPHEE,
NAKAYAMA, VALENTINE

ASSOCIATE PROFESSORS

BULEY, COREY, CORMAN, CRAWFORD, DAVEY,
GUERRERO, MAYER, TROST

ASSISTANT PROFESSORS

BROOKEY, BROUDER, DAVIS, FLOYD, MARTINEZ,
MESSMAN, PARK-FULLER, TRACY, TRETHERWEY

INSTRUCTIONAL PROFESSIONAL

OLSON

ASSISTANT INSTRUCTIONAL PROFESSIONAL

McDONALD

PURPOSE

The Hugh Downs School of Human Communication exists to advance the understanding of message-related human behavior for the purpose of improving communicative interactions. Teaching, research, and service are directed to the continued development of knowledge and application of principles of communication. Employers have ranked interpersonal, analytical, teamwork, computer, and verbal communication skills as the top five skills desired for new hires. The curriculum is designed so that majors are proficient in each of these areas upon graduation. Courses are not offered in broadcasting or journalism.

GENERAL INFORMATION

A minimum GPA of 2.50 is required for enrollment in all upper-division courses and COM 207. A minimum GPA of 2.25 is required for enrollment in COM 110, 241, 250, and 263.

Communication Major Requirements. Undergraduate premajor students may be admitted to major status after meeting all of the following requirements: (1) College of Public Programs major status admission requirements (see "Admission," page 466); and (2) completion of 12 semester hours of Communication major core course requirements (COM 100, 207, 225, 308) with a minimum grade of "C" in each.

Students may reach major status upon successful completion of COM 308; they do not need to apply for major status.

DEGREE REQUIREMENTS

B.A. and B.S. Degrees

Students may choose to complete either a Bachelor of Arts or Bachelor of Science degree in Communication. The B.A. degree requires a minimum of 51 semester hours, including six hours of related area courses and a capstone course (COM 404, 407, or 484). The B.S. degree requires a minimum of 51 semester hours, including a General Studies CS (statistics) course, COM 408, and a capstone course (COM 404 or 407).

Both degree options require that students take four core courses (COM 100, 207, 225, and 308) plus 15 semester hours (five courses) where introductory courses are paired with advanced courses described below.

Students must choose three of the following courses for a total of nine semester hours:

COM 110 Elements of Interpersonal Communication <i>SB</i>	3
or COM 310 Relational Communication (3)	
COM 241 Introduction to Oral Interpretation <i>L/HU</i>	3
COM 250 Introduction to Organizational Communication <i>SB</i>	3
COM 263 Elements of Intercultural Communication <i>SB, C, G</i>	3
COM 321 Rhetorical Theory and Research <i>L/HU, H</i>	3

Students must then match two of the three courses selected above with the corresponding 400-level courses—the last two digits of the course numbers match—from the following list for a total of six hours:

COM 410 Interpersonal Communication Theory and Research <i>SB</i>	3
COM 421 Rhetoric of Social Issues <i>HU</i>	3
COM 441 Performance Studies <i>HU</i>	3
COM 450 Theory and Research in Organizational Communication <i>SB</i>	3
COM 463 Intercultural Communication Theory and Research <i>SB, G</i>	3

Another 15 semester hours (five courses) must be communication electives, only three hours (one course) of which may be 100- or 200-level. A minimum grade of "C" is required in all communication courses except for a maximum of six semester hours of "Y" credit available to qualified students in COM 281, 382, and/or 484.

To assure the breadth and depth of their education, all Communication undergraduates must complete the requirements of the university General Studies, the College of Public Programs, and the Hugh Downs School of Human Communication. For descriptive information on university requirements, refer to "General Studies," page 78, and "University Graduation Requirements," page 74. Students in the College of Public Programs are required to take an advanced composition course (which meets the General Studies L requirement). Although many Communication courses meet the university General Studies requirements for literacy and critical inquiry (L), students must take an advanced composition course *from the list provided by the College of Public Programs*.

Students should consult the school for current information concerning College of Public Programs and Hugh Downs School of Human Communication requirements.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Communication Internships

Internships (COM 484) consist of supervised field experiences and are available to upper-level undergraduate students with major status and a GPA higher than 2.50. Students must also have completed or be concurrently enrolled in COM 410, 421, 441, 450, or 463. An application for internship must be completed in the semester before the intended term for an internship. Contact the school for specific deadline dates. Internships must receive prior approval from the internship programs coordinator *before* student registration for the course. Internships may be taken for up to six semester hours.

MINOR IN COMMUNICATION

The minor in Communication consists of 15 semester hours of courses, including COM 100 plus COM 225 or 259, and nine additional semester hours, at least six of which must be in the upper division. Nine of the total 15 semester hours must be ASU Main resident credits including six semester hours of upper-division credit. No pass/fail, "Y" credit, or credit/no-credit courses are allowed. Communication courses required for one's major may not also count for the minor. All prerequisite and GPA requirements must be met. The "C" minimum requirement must be met for each class.

GRADUATE PROGRAMS

In addition to offering an M.A. degree program, the Hugh Downs School of Human Communication also offers an interdisciplinary Ph.D. degree program in Communication. See the *Graduate Catalog* for the requirements and areas of concentration.

HUGH DOWNS SCHOOL OF HUMAN COMMUNICATION (COM)

COM 100 Introduction to Human Communication. (3)

fall, spring, summer

Topics-oriented introduction to basic theories, dimensions, and concepts of human communicative interaction and behavior.

General Studies: SB

COM 110 Elements of Interpersonal Communication. (3)

fall, spring, summer

Demonstration and practice of communicative techniques in establishing and maintaining interpersonal relationships. Prerequisite: 2.25 GPA.

General Studies: SB

COM 207 Introduction to Communication Inquiry. (3)

fall, spring, summer

Bases of inquiry into human communication, including introduction to notions of theory, philosophy, problems, and approaches to the study of communication. Prerequisites: COM 100; 2.50 GPA.

COM 222 Argumentation. (3)

fall and spring

Philosophical and theoretical foundations of argumentation, including a comparison of models of advocacy and evidence. Prerequisite: ENG 101 (or 105).

General Studies: L

COM 225 Public Speaking. (3)

fall, spring, summer

Verbal and nonverbal communication in platform speaking. Discussion and practice in vocal and physical delivery and in purposeful organization and development of public communication. Prerequisite: ENG 101 (or 105).

General Studies: L

COM 230 Small Group Communication. (3)

fall, spring, summer

Principles and processes of small group communication, attitudes, and skills for effective participation and leadership in small groups, small group problem solving, and decision making.

General Studies: SB

COM 241 Introduction to Oral Interpretation. (3)

fall, spring, summer

Communication of literary materials through the mode of performance. Verbal and nonverbal behavior, interface of interpreter with literature and audience, and rhetorical and dramatic analysis of literary modes. Prerequisites: ENG 101 (or 105); 2.25 GPA.

General Studies: L/HU

COM 250 Introduction to Organizational Communication. (3)

fall, spring, summer

Introduction to the study of communication in organizations, including identification of variables, roles, and patterns influencing communication in organizations. Prerequisite: 2.25 GPA.

General Studies: SB

COM 251 Interviewing. (3)

not regularly offered

Principles and techniques of interviewing, including practice through real and simulated interviews in informational, persuasive, and employee-related situations. Not open to freshmen.

COM 259 Communication in Business and the Professions. (3)

fall, spring, summer

Interpersonal, group, and public communication in business and professional organizations. Not open to freshmen and not available for credit toward the major.

COM 263 Elements of Intercultural Communication. (3)

fall, spring, summer

Basic concepts, principles, and skills for improving communication between persons from different minority, racial, ethnic, and cultural backgrounds. Lecture, discussion. Cross-listed as AFR 263. Credit is allowed for only AFR 263 or COM 263. Prerequisite: 2.25 GPA.

General Studies: SB, C, G

COM 271 Voice Improvement. (3)

not regularly offered

Intensive personal and group experience to improve normal vocal usage, including articulation and pronunciation.

COM 281 Communication Activities. (1–3)

fall, spring, summer

Nongraded participation in forensics or interpretation cocurricular activities. Maximum 3 semester hours each semester. Prerequisite: instructor approval.

COM 294 Special Topics. (3)

fall, spring, summer

COM 300 CIS: Communication in Interdisciplinary Studies. (3)

fall, spring, summer

Examination and analysis of communication in the context of other academic disciplines. May be repeated for credit. Open to B.I.S. majors only. Prerequisites: both COM 100 and 225 or only COM 259; 2.00 GPA.

COM 301 Introductory Theories and Principles of Communication in Relationships, Organizations, and Public Contexts. (3–9)

once a year

Integrated introduction to the theories and principles of communication in public, interpersonal, and organizational contexts. Lecture, discussion, online component.

COM 308 Advanced Research Methods in Communication. (3)

fall, spring, summer

Advanced communication research methods, including quantitative, qualitative, and critical approaches. Prerequisite: minimum cumulative ASU GPA of 2.50. Prerequisites with a grade of "C" or higher: COM 207; MAT 114 (or higher-level MAT course).

General Studies: L

COM 310 Relational Communication. (3)

fall and spring

Exploration of communication issues in the development of personal relationships. Current topics concerning communication in friendship, romantic, and work relationships. Prerequisites: COM 100; minimum cumulative ASU GPA of 2.50.

COM 312 Communication, Conflict, and Negotiation. (3)

fall and spring

Theories and strategies of communication relevant to the management of conflicts and the conduct of negotiations. Prerequisites: COM 100; minimum cumulative ASU GPA of 2.50.

COM 316 Gender and Communication. (3)

fall and spring

Introduction to gender-related communication. Verbal, nonverbal, and paralinguistic differences and similarities are examined within social, psychological, and historic perspectives. Prerequisite: minimum cumulative ASU GPA of 2.50.

General Studies: SB, C

COM 317 Nonverbal Communication. (3)

fall and spring

Study of communication using space, time, movement, facial expression, touch, appearance, smell, environment, objects, voice, and gender/cultural variables. Not open to students with credit in COM 294 ST: Beyond Words. Prerequisite: minimum cumulative ASU GPA of 2.50.

COM 319 Persuasion and Social Influence. (3)

fall, spring, summer

Variables that influence and modify attitudes and behaviors of message senders and receivers, including analysis of theories, research, and current problems. Prerequisites: COM 207 (or its equivalent); minimum cumulative ASU GPA of 2.50. Prerequisite for nonmajors: POS 401 or PSY 230 or QBA 221 or SOC 390 or STP 226.

General Studies: SB

COM 320 Communication and Consumerism. (3)

once a year

Critical evaluation of messages designed for public consumption. Perceiving, evaluating, and responding to political, social, and commercial communication. Prerequisite: minimum cumulative ASU GPA of 2.50.

General Studies: SB

COM 321 Rhetorical Theory and Research. (3)

fall and spring

Historical development of rhetorical theory and research in communication, from classical antiquity to the present. Prerequisites: COM 100; minimum cumulative ASU GPA of 2.50.

General Studies: L/HU, H

COM 323 Communication Approaches to Popular Culture. (3)

fall, spring, summer

Critical analysis of popular culture within social and political contexts; emphasis on multicultural influences and representations in everyday life. Lecture, discussion. Prerequisites: COM 100; minimum cumulative ASU GPA of 2.50.

General Studies: C

COM 325 Advanced Public Speaking. (3)

fall and spring

Social and pragmatic aspects of public speaking as a communicative system; strategies of rhetorical theory and the presentation of forms of public communication. Prerequisites: COM 225; minimum cumulative ASU GPA of 2.50.

General Studies: L

COM 341 Social Contexts for Performance. (3)

not regularly offered

Adaptation and performance of literature for the community outside the university. Research into the practical uses of performed literature. Prerequisite: minimum cumulative ASU GPA of 2.50.

COM 344 Performance of Oral Traditions. (3)

not regularly offered

Cultural beliefs and values studied through ethnographic research and performance of personal narratives, folklore, myths, legends, and other oral traditions. Lecture, fieldwork, research paper. Prerequisite: minimum cumulative ASU GPA of 2.50.

General Studies: HU, C

COM 357 Communication Technology and Information Diffusion. (3)

fall

Studies effects of new communication technology on society, organizations, and individuals. Hands-on experience plus critical analysis of theory and research. Prerequisites: both COM 250 (or MGT 301 or PGS 430 or SOC 301) and CSE 180 (or its equivalent) or only instructor approval; minimum cumulative ASU GPA of 2.50.

General Studies: SB

COM 371 Language, Culture, and Communication. (3)

fall and spring

Cultural influences of language on communication, including social functions of language, bilingualism, biculturalism, and bidialectism. Lecture, discussion. Cross-listed as AFR 371. Credit is allowed for only AFR 371 or COM 371. Prerequisites: COM 263 (or AFR 263) or instructor approval; minimum cumulative ASU GPA of 2.50.

General Studies: SB, C, G

COM 382 Classroom Apprenticeship. (1–3)

fall, spring, summer

Nongraded credit for students extending their experience with a content area by assisting with classroom supervision in other COM courses (maximum 3 semester hours each semester). Prerequisites: 2.50 GPA; written instructor approval.

COM 394 Special Topics. (1–4)

fall, spring, summer

Prerequisite: minimum cumulative ASU GPA of 2.50.

COM 400 CIP: Communication in Professions. (3)

fall, spring, summer

Specialized study of communication processes in professional and organizational settings. May be repeated for credit. Open to B.I.S. majors only. Lecture, discussion. Prerequisites: both COM 100 and 225 or only COM 259; 2.00 GPA.

General Studies: HU, C

COM 404 Research Apprenticeship. (3)

fall and spring

Direct research experience on faculty projects. Student/faculty match based on interests. Lecture, apprenticeship. Prerequisites: COM 308 (or instructor approval); minimum cumulative ASU GPA of 2.50; application required.

COM 407 Advanced Critical Methods in Communication. (3)

spring

Examination of critical approaches relevant to communication, including textuality, social theory, cultural studies, and ethnography. Lecture, discussion. Prerequisites: COM 308; minimum cumulative ASU GPA of 2.50.

COM 408 Quantitative Research Methods in Communication. (3)

fall and spring

Advanced designs, measurement techniques, and methods of data analysis of communication research. Prerequisites: COM 308 and a generic statistics course (EDP 454 or POS 401 or PSY 230 or QBA 221 or SOC 390 or STP 226); minimum cumulative ASU GPA of 2.50.

COM 410 Interpersonal Communication Theory and Research. (3)

fall, spring, summer

Survey and analysis of major research topics, paradigms, and theories dealing with message exchanges between and among social peers. Prerequisites: COM 110 (or 310), 308; minimum cumulative ASU GPA of 2.50.

General Studies: SB

COM 411 Communication in the Family. (3)

once a year

Broad overview of communication issues found in marriage and family life, focusing on current topics concerning communication in the family. Prerequisites: COM 110 (or 310), 207; minimum cumulative ASU GPA of 2.50.

General Studies: SB

COM 414 Crisis Communication. (3)

not regularly offered

Role of communication in crisis development and intervention. Prerequisite: minimum cumulative ASU GPA of 2.50.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

COM 417 Communication and Aging. (3)*not regularly offered*

Critical study of changes in human communicative patterns through the later adult years, with attention on intergenerational relationships and self-concept functions. Prerequisite: minimum cumulative ASU GPA of 2.50.

COM 421 Rhetoric of Social Issues. (3)*fall and spring*

Critical rhetorical study of significant speakers and speeches on social issues of the past and present. Prerequisites: COM 308, 321 (or 323). *General Studies: HU*

COM 422 Advanced Argumentation. (3)*not regularly offered*

Advanced study of argumentation theories and research as applied to public forum, adversary, scholarly, and legal settings. Prerequisites: COM 222; minimum cumulative ASU GPA of 2.50.

COM 426 Political Communication. (3)*fall*

Theories and criticism of political communication; including campaigns, mass persuasion, propaganda, and speeches. Emphasis on rhetorical approaches. Prerequisite: minimum cumulative ASU GPA of 2.50.

*General Studies: SB***COM 430 Leadership in Group Communication. (3)***not regularly offered*

Theory and process of leadership in group communication, emphasizing philosophical foundations, contemporary research, and applications to group situations. Prerequisites: COM 230; minimum cumulative ASU GPA of 2.50.

COM 441 Performance Studies. (3)*fall, spring, summer*

Theory, practice, and criticism of texts in performance. Emphasis on the interaction between performer, text, audience, and context. Prerequisites: COM 241, 308; minimum cumulative ASU GPA of 2.50.

*General Studies: HU***COM 445 Narrative Performance. (3)***not regularly offered*

Theory and practice of performing narrative texts (e.g., prose fiction, oral histories, diaries, essays, letters). Includes scripting, directing, and the rhetorical analysis of storytelling. Prerequisites: COM 241; minimum cumulative ASU GPA of 2.50.

*General Studies: HU***COM 446 Interpretation of Literature Written by Women. (3)***not regularly offered*

Explores, through performance and critical writing, literature written by women. Prerequisite: minimum cumulative ASU GPA of 2.50.

*General Studies: HU, C***COM 450 Theory and Research in Organizational Communication. (3)***fall, spring, summer*

Critical review and analysis of the dominant theories of organizational communication and their corollary research strategies. Prerequisites: COM 250, 308; minimum cumulative ASU GPA of 2.50.

*General Studies: SB***COM 453 Communication Training and Development. (3)***once a year*

Examination of the procedures and types of communication training and development in business, industry, and government. Prerequisites: COM 250; minimum cumulative ASU GPA of 2.50.

COM 463 Intercultural Communication Theory and Research. (3)*fall, spring, summer*

Survey and analysis of major theories and research dealing with communication between people of different cultural backgrounds, primarily in international settings. Lecture, discussion, small group work. Cross-listed as AFR 463. Credit is allowed for only AFR 463 or COM 463. Prerequisites: both COM 263 (or AFR 263) and 308 or only instructor approval; minimum cumulative ASU GPA of 2.50.

*General Studies: SB, G***COM 465 Intercultural Communication Workshop. (3)***not regularly offered*

Experientially based study of communication between members of different cultures designed to help students improve their intercultural communication skills. Prerequisites: minimum cumulative ASU GPA of 2.50; instructor approval.

COM 484 Communication Internship. (1–6)*fall, spring, summer*

Fee. Prerequisites: COM 225, 308; minimum cumulative ASU GPA of 2.50; application required. Pre- or corequisite: COM 410 or 421 or 441 or 450 or 463.

COM 494 Special Topics. (1–3)*fall, spring, summer*

Prerequisite: minimum cumulative ASU GPA of 2.50.

COM 501 Research Methods in Communication. (3)*fall*

Critical analysis of systems of inquiry in communication, focusing on the identification of variables and approaches to conducting research in communication. Prerequisite: instructor approval.

COM 504 Theories and Models in Communication. (3)*fall*

Theory construction, metatheoretical concerns, models, construct definition, and comparative analysis of current theories in communication. Prerequisite: instructor approval.

COM 508 Quantitative Research Methods in Communication. (3)*fall*

Empirical research designs, measurements, and statistical strategies and techniques in analyzing and evaluating experimental and descriptive research in communication. Prerequisites: both COM 501 and 504 or only instructor approval.

COM 509 Qualitative Research Methods in Communication. (3)*spring*

Qualitative research methods, including interviewing, field methods, and other nonquantitative techniques for analyzing communication. Prerequisites: both COM 501 and 504 or only instructor approval.

COM 510 Interpersonal Communication Theory and Research. (3)*once a year*

Contemporary theories and research in interpersonal communication. Prerequisites: both COM 501 and 504 or only instructor approval.

COM 512 Death, Society, and Human Experience. (3)*not regularly offered*

Examines dying, death, bereavement, and suicide from both individual and sociocultural perspectives in terms of options for communication and action in death-related situations. Prerequisite: instructor approval.

COM 521 Rhetorical Criticism of Public Discourse. (3)*not regularly offered*

History and significance of rhetorical theory and criticism in the analysis of public discourse. Prerequisites: both COM 501 and 504 or only instructor approval.

COM 584 Communication Internship. (1–12)*fall, spring, summer*

Fee.

COM 596 Pro-Seminar in Communication. (0)*fall*

Discussion of research projects with the faculty. Prerequisite: admission to the graduate program.

COM 604 Theory Construction in Communication. (3)*fall*

Review and analysis of philosophical problems inherent in communicative research and of metatheories designed to deal with these problems. Prerequisite: COM 504 or instructor approval.

COM 607 Contemporary Rhetorical Methods. (3)*spring*

Analysis of issues in the practice of rhetorical communication research, including criticism and scholarship. Seminar.

COM 608 Multivariate Statistical Analysis of Data in Communication. (3)*spring*

Statistical analysis of communication research data. Multivariate procedures used in communication research and methods of causal analysis. Prerequisites: COM 501 and 508 (or their equivalents).

COM 609 Advanced Qualitative Research Methods in Communication. (3)*fall*

Analysis of issues in the practice of qualitative communication research, including data gathering, fieldwork issues, analysis strategies, and reporting results. Prerequisite: COM 509 or instructor approval.

COM 680 Practicum: Research in Communication. (3)

spring

Guided practice in the conduct of communication research. Topic identification; procedures, formats, and ethics of publishing. Prerequisite: COM 604.

COM 691 Seminar. (1–12)

fall, spring, summer

Lecture, discussion. Possible topics:

- (a) Current Organizational Approaches to Communication. (3)
- (b) Examination of Privacy and Disclosure. (3)
- (c) Intercultural Aspects of Communication. (3)
- (d) Interpersonal and Relational Communication. (3)
- (e) Research in Performance Studies. (3)
- (f) Rhetorical Issues. (3)
- (g) Social Influence. (3)

Prerequisite: instructor approval.

COM 792 Research. (1–12)

not regularly offered

COM 799 Dissertation. (1–15)

not regularly offered

Walter Cronkite School of Journalism and Telecommunication

Joe S. Foote
Director

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PROFESSORS

CRAFT, CRONKITE, DOIG, FOOTE, GODFREY,
HALVERSON, MERRILL, SYLVESTER, WATSON, YOUM

ASSOCIATE PROFESSORS

ALLEN, BARRETT, BRAMLETT-SOLOMON, GALICIAN,
HOY, LENTZ, MATERA, RUSSELL, RUSSOMANNO

CLINICAL PROFESSORS

ITULE, LEIGH

LECTURERS

CASAVANTES, NICHOLS, WONG

SENIOR ADMINISTRATIVE PROFESSIONAL

LEIGH

PURPOSE AND PHILOSOPHY

The primary purpose of the Walter Cronkite School of Journalism and Telecommunication is to prepare students to enter positions in media fields. The school strives to meet its mission through a three-pronged approach:

1. classroom instruction in a blend of conceptual courses, such as media law, media ethics, media history, and media management and skills courses, such as writing, editing, reporting, and production techniques;
2. on-campus media work opportunities, such as the *State Press*, the independent daily newspaper; KASC radio; KAET-TV; KAET-TV/Cactus State

Poll; and “Newswatch,” a weekly student-produced cable television news magazine program; and

3. off-campus media work opportunities, including internships in print, broadcast, public relations, and visual journalism.

In addition to preparing students to assume positions in the media and media-related enterprises, the school provides courses that lead to a better understanding of the role and responsibility of the media in society’s public and private sectors.

ADMISSION

Preprofessional Admission

Students admitted to ASU also may be admitted to the Walter Cronkite School of Journalism and Telecommunication with preprofessional status. Preprofessional admission to the school does not guarantee admission to the upper-division professional program. All preprofessional students enrolling in courses in the school must complete a minimum of 30 semester hours with at least a 2.50 GPA before they are permitted to enroll in school courses at the 200-level. All preprofessional students who intend to take courses beyond the 100-level must pass an English proficiency examination administered by the school.

Professional Program Admission

Admission to the Walter Cronkite School of Journalism and Telecommunication professional program, which enrolls students in their junior and senior years, is competitive and based on available resources. Once a student is granted admission, the upper-division professional program generally requires two years to complete.

A separate application procedure is required for entry to the upper-division professional program. To be eligible to apply for admission to the professional program, students must

1. be admitted to ASU as a classified student;
2. have completed at least 56 semester hours by the close of the semester in which the application is submitted;
3. have completed lower-division courses or their equivalents, as specified below;
4. have completed, with a passing score, the English proficiency examination administered by the school; and
5. have met College of Public Programs major status admissions requirements.

As described above, students must have completed specified lower-division courses. Broadcasting preprofessionals must complete the following courses:

MCO 110 Introduction to Mass Communication <i>SB</i>	3
or MCO 120 Media and Society <i>SB</i> (3)	
TCM 200 Fundamentals of Radio-Television	3
TCM 201 Radio-Television Writing <i>L</i>	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

TCM 235 Production Techniques*	3
Total	12

* TCM 235 may be in progress at the time of application but must be completed to enroll in the professional program courses.

Journalism preprofessionals must complete the following courses:

JRN 201 Journalism Newswriting <i>L</i>	3
MCO 110 Introduction to Mass Communication <i>SB</i> or MCO 120 Media and Society <i>SB</i> (3)	3
Total	6

To be considered for admission to the school's upper-division professional program, students must obtain an application form from the school office in STAUF A231. Precise application procedures and submission deadlines are outlined on the form. Completion of the minimum requirements for eligibility does not guarantee admission to the upper-division professional program. The admissions committee considers a variety of criteria, including cumulative GPA, media experience, writing ability, and commitment to the field.

ADVISING

Students should follow the sequence of courses outlined on school curriculum check sheets and the advice of the school's academic advisors. All students who enroll as pre-professionals or who seek and ultimately gain professional status should meet regularly with Walter Cronkite School of Journalism and Telecommunication academic advisors. Conscientious, careful planning and early advising are crucial to students who desire to progress through the program in a timely fashion.

DEGREES

The faculty in the school offer programs leading to two undergraduate degrees: the B.A. degree in Broadcasting and the B.A. degree in Journalism. Students select one of two concentrations in the broadcasting program: broadcast journalism or business/management. Students select one of three areas of concentration in the journalism program: news editorial, public relations, or visual journalism.

The school offers a program leading to the graduate degree Master of Mass Communication.

TRANSFER STUDENTS

Transfer students must be admitted formally to ASU and must adhere to the admission procedures to be considered for admission to the professional program in the Walter Cronkite School of Journalism and Telecommunication.

Students completing their first two years of course work at a community college or four-year institution other than ASU should consult the school's academic advisors at least three months before they hope to be considered for admission to the school's professional program. Transfer student admission to ASU does not guarantee admission to the upper-division professional program.

PROGRAM REQUIREMENTS

Because the Walter Cronkite School of Journalism and Telecommunication is accredited by the Accrediting Coun-

cil on Education in Journalism and Mass Communication, its students are required to take a minimum of 90 semester hours in courses outside the majors of Broadcasting or Journalism, with no fewer than 65 semester hours in liberal arts and sciences. This requirement ensures that students receive a broad academic background.

At least 18 semester hours of major courses required by the school, including one writing course, must be taken at ASU. A student must receive a grade of "C" or higher in all courses taken in the major and in the required related field area.

B.A. REQUIREMENTS

All students are required to demonstrate proficiency in a language other than English (a spoken language or American Sign Language). Proficiency is defined as completing the second semester intermediate level, or higher, of a language other than English with a grade of "C" or higher.

Broadcasting. The major in Broadcasting consists of a minimum of 30 semester hours in Walter Cronkite School of Journalism and Telecommunication courses. Students must take the following courses:

MCO 110 Introduction to Mass Communication <i>SB</i> or MCO 120 Media and Society <i>SB</i> (3)	3
MCO 402 Mass Communication Law <i>L</i>	3
TCM 200 Fundamentals of Radio-Television	3
TCM 201 Radio-Television Writing <i>L</i>	3
TCM 235 Production Techniques	3
Total	15

The student also must choose one major concentration area from the following: broadcast journalism or business/management.

These courses are in addition to other degree requirements. See "University Graduation Requirements," page 74.

Journalism. The major in Journalism consists of a minimum of 30 semester hours in Walter Cronkite School of Journalism and Telecommunication courses. Students must take the following required school courses:

JRN 201 Journalism Newswriting <i>L</i>	3
JRN 301 Reporting <i>L</i>	3
JRN 313 Introduction to Editing	3
MCO 110 Introduction to Mass Communication <i>SB</i> or MCO 120 Media and Society <i>SB</i> (3)	3
MCO 402 Mass Communication Law <i>L</i>	3
MCO 418 History of Mass Communication <i>SB, H</i> or MCO 421 News Problems (3) or MCO 430 International Mass Communication <i>G</i> (3) or MCO 450 Visual Communication <i>HU</i> (3)	3
Total	18

The student also must choose one concentration area from the following three: news editorial, public relations, or visual journalism.

These courses are in addition to other degree requirements. See "University Graduation Requirements," page 74.

Related Field. Each student is required to complete a 12-semester-hour related field to complement the courses taken in the major concentration areas.

SECONDARY EDUCATION—B.A.E.

Journalism. The academic specialization in journalism as a major teaching field consists of 45 semester hours. The following courses are required:

JRN 201 Journalism Newswriting <i>L</i>	3
JRN 301 Reporting <i>L</i>	3
JRN 313 Introduction to Editing.....	3
JRN 351 Photojournalism I.....	3
MCO 110 Introduction to Mass Communication <i>SB</i>	3
or MCO 120 Media and Society <i>SB</i> (3)	
MCO 402 Mass Communication Law <i>L</i>	3
Approved elective	3
<hr/>	
Total	21

An additional 24 semester hours, including 12 semester hours in school course offerings, must be taken on approval by the advisor in consultation with the student. The remaining courses may be in closely related fields.

The academic specialization in journalism as a minor teaching field consists of 24 semester hours. The following courses are required:

JRN 201 Journalism Newswriting <i>L</i>	3
JRN 301 Reporting <i>L</i>	3
JRN 313 Introduction to Editing.....	3
JRN 351 Photojournalism I.....	3
MCO 110 Introduction to Mass Communication <i>SB</i>	3
or MCO 120 Media and Society <i>SB</i> (3)	
Approved elective	3
<hr/>	
Total	18

The remaining courses are to be selected in consultation with a journalism advisor.

GENERAL STUDIES REQUIREMENTS

The students must satisfy the university General Studies requirement found in “General Studies,” page 78, and the College of Public Programs course requirements found under “College Degree Requirements,” page 468. The student is advised to review carefully the appropriate school curriculum check sheet to be sure courses taken move the student toward graduation with the least amount of delay and difficulty. Note that all three General Studies awareness areas are required.

General education requirements for the Walter Cronkite School of Journalism and Telecommunication follow.

Humanities and Fine Arts. Three to six semester hours are required for a total of nine semester hours when combined with university General Studies.

Social and Behavioral Sciences. Six to nine semester hours are required for a total of 15 when combined with university General Studies.

Additional courses may be taken in each of the groups and from the electives listed to complete the total of 51 semester hours required by the school.

Within the program there are specific course requirements. Students are required to take one course in each of the following areas: communication (applied speech), computer science, economics, English composition (beyond the

freshman level), English literature, history, mathematics (numeracy requirement), two natural science lab courses, philosophy, political science (either POS 110 or 310), psychology, and statistics.

MINOR IN MASS COMMUNICATION

The faculty in the School of Journalism and Telecommunication offer a minor in Mass Communication consisting of the required course MCO 120 Media and Society and 12 additional semester hours of upper-division ASU Main campus resident credit taken from a list of approved courses. The following courses are included:

MCO 418 History of Mass Communication <i>SB, H</i>	3
MCO 430 International Mass Communication <i>G</i>	3
MCO 450 Visual Communication <i>HU</i>	3
MCO 456 Political Communication <i>SB</i>	3
MCO 460 Race, Gender, and Media <i>C</i>	3
MCO 494 Special Topics	3

To take upper-division courses, the student must be at least a sophomore (25 semester hours). To pursue the minor in Mass Communication, the student must maintain a minimum 2.00 overall GPA, must obtain a minimum “C” grade in each course in the minor, and must have a major other than Journalism or Broadcasting.

GRADUATE PROGRAM

Master of Mass Communication. The curriculum for the M.M.C. degree is designed to help students achieve intellectual and professional growth, to prepare students for positions in the mass media, and to provide a background to enable those currently in the media to advance their careers. Information on the Master of Mass Communication program is detailed in the *Graduate Catalog*.

JOURNALISM (JRN)

JRN 201 Journalism Newswriting. (3)

fall, spring, summer
Writing news for the print media. Prerequisites: ENG 101 (or 105); MCO 110 (or 120); successful completion of English proficiency requirement; demonstrated typing ability of 30 words per minute. *General Studies: L*

JRN 301 Reporting. (3)

fall and spring
Fundamentals of news gathering, interviewing, and in-depth reporting. Prerequisites: JRN 201; professional program admission; school major. *General Studies: L*

JRN 313 Introduction to Editing. (3)

fall and spring
Copyediting and headline writing. Electronic editing on personal computer terminals. Prerequisites: JRN 301; professional program admission.

JRN 351 Photojournalism I. (3)

fall and spring
Taking, developing, and printing pictures for newspaper and magazine production on a media deadline basis. Students should have their own cameras. Prerequisites: JRN 201 (or instructor approval); professional program admission.

JRN 401 Public Relations Techniques. (3)

fall and spring
Theory and practice of publicity, public relations, and related techniques and procedures. Prerequisites: JRN 301 (or TCM 315); professional program admission.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

JRN 412 Editorial Interpretation. (3)*not regularly offered*

The press as an influence on public opinion. Role of the editorial in analyzing and interpreting current events. Prerequisites: JRN 301; professional program admission.

JRN 413 Advanced Editing. (3)*fall and spring*

Theory and practice of newspaper editing, layout and design, picture and story selection. Prerequisites: JRN 313; professional program admission.

JRN 414 Electronic Publication Design. (3)*fall and spring*

Theory, organization, and practice of layout, typography, and design in traditional and multimedia publishing. Prerequisites: JRN 401; professional program admission.

JRN 415 Writing for Public Relations. (3)*fall and spring*

Development of specific writing techniques for the practitioner in public relations agencies and divisions of major organizations. Prerequisites: JRN 401; professional program admission.

JRN 417 Public Relations Campaigns. (3)*fall*

Theory, principles, and literature of public relations and how they relate to audiences, campaigns, and ethics. Prerequisites: both JRN 401 and 415 or only instructor approval; professional program admission.

JRN 420 Reporting Public Affairs. (3)*fall and spring*

Instruction and assignments in reporting the courts, schools, government, city hall, social problems, and other areas involving public issues. Prerequisites: JRN 301; professional program admission.

JRN 440 Magazine Writing. (3)*fall and spring*

Writing and marketing magazine articles for publication. Prerequisites: JRN 301 (or instructor approval); professional program admission.

JRN 451 Photojournalism II. (3)*fall and spring*

Theory and practice of photojournalism with emphasis on shooting, lighting, and layout for the media. Prerequisites: JRN 351; professional program admission.

JRN 452 Photojournalism III. (3)*fall and spring*

Advanced theory and practice of photojournalism with emphasis on the photo essay and illustrations in black and white and color. 2 hours lecture, 2 hours lab. Prerequisites: JRN 451; professional program admission.

JRN 465 Precision Journalism. (3)*spring*

Advanced writing course with focus on reporting polls and surveys and other numerically-based stories as well as on understanding the concepts that underlie polls and surveys. Lecture, lab. Prerequisites: JRN 301 (or instructor approval); professional program admission.

JRN 470 Depth Reporting. (3)*fall and spring*

Introduces strategies for writing in-depth newspaper or magazine articles. Lecture, lab. Prerequisites: JRN 301; professional program admission; instructor approval.

MASS COMMUNICATION (MCO)**MCO 110 Introduction to Mass Communication. (3)***fall and summer*

Organization, function, and responsibilities of the media and adjunct services. Primary emphasis on newspapers, radio, television, and magazines. Credit is allowed for only MCO 110 or 120. Prerequisite: ENG 101 or 105 or 107.

*General Studies: SB***MCO 120 Media and Society. (3)***fall and spring*

Role of newspapers, magazines, radio, television, and motion pictures in American society. Credit is allowed for only MCO 120 or 110. Designed for nonmajors.

*General Studies: SB***MCO 402 Mass Communication Law. (3)***fall, spring, summer*

Legal aspects of the rights, privileges, and obligations of the press, radio, and television. Prerequisites: 70 hours; major professional status in Broadcasting or Journalism.

*General Studies: L***MCO 418 History of Mass Communication. (3)***fall and spring*

American journalism from its English and colonial origins to the present day. Development and influence of newspapers, magazines, radio, television, and news gathering agencies.

*General Studies: SB, H***MCO 421 News Problems. (3)***spring*

Trends and problems of the news media, emphasizing editorial decisions in the processing of news. Prerequisite: 9 hours in mass communication/journalism/telecommunication courses or instructor approval.

MCO 430 International Mass Communication. (3)*fall and spring*

Comparative study of communication and media systems. Information gathering and dissemination under different political and cultural systems.

*General Studies: G***MCO 450 Visual Communication. (3)***fall, spring, summer*

Theory and tradition of communication through the visual media with emphasis on the continuity of traditions common to modern visual media.

*General Studies: HU***MCO 456 Political Communication. (3)***fall and spring*

Theory and research related to political campaign communication. The persuasive process of political campaigning, the role of the media, the candidate, and image creation.

*General Studies: SB***MCO 460 Race, Gender, and Media. (3)***spring*

Reading seminar designed to give students a probing examination of the interface between AHANA Americans and the mass media in the United States. Lecture, discussion. Cross-listed as AFR 460. Credit is allowed for only AFR 460 or MCO 460.

*General Studies: C***MCO 463 Introduction to Media Statistics. (3)***fall and spring*

Introduction to statistical analysis as applied to the mass media. Prerequisite: major professional status in Broadcasting or Journalism.

MCO 470 Issues Management and Media Strategy. (3)*fall*

Strategic aspects of media planning and management in public relations, public affairs, crisis communication lobbying, media ethics, and government relations. Seminar. Prerequisite: JRN 401 or instructor approval.

MCO 494 Special Topics. (3)*not regularly offered***MCO 501 Newswriting and Reporting. (3)***fall*

Designed for graduate students in the M.M.C. program who have undergraduate degrees in nonjournalism areas. Objective is to teach fundamentals of writing and reporting. Lecture, lab. Prerequisite: acceptance into M.M.C. graduate program.

MCO 503 Press Freedom Theory. (3)*spring*

Examines philosophical and legal aspects of press freedom. Emphasis on First Amendment theory evolution from 1791 to present.

MCO 510 Research Methodology in Mass Communication. (3)*fall and spring*

Identifies research problems in mass communication. Overview of questionnaire construction. Attention to survey, historical, content analysis, experimental, and legal research methods.

MCO 520 Mass Communication Theories and Process. (3)*fall*

Analyzes various theoretic models of mass communication with emphasis on the applications of these theories to various professional communication needs.

MCO 522 Mass Media and Society. (3)*spring*

Mass media as social institutions, particularly interaction with government and public. Emphasis on criticism and normative statements.

MCO 530 Media Ethics. (3)*fall*

Ethical conventions and practices of print and electronic media as they relate to the government and private sectors of the society.

MCO 531 Broadcast Journalism. (3)*spring*

News and information practices of networks, stations, and industry. Practice in writing, reporting, and editing with emphasis on video. Lecture, lab. Prerequisite: MCO 501.

MCO 540 Historical/Legal Methods. (3)*spring*

Introduction to legal and historical methods necessary to conduct qualitative mass communication research. Prerequisite: M.M.C. graduate student.

MCO 560 Arizona Media Law. (3)*fall*

Case study approach of first amendment issues, media access, libel, confidentiality, and invasion of privacy as applied to media organizations in Arizona. Lecture, seminar.

MCO 593 Applied Project. (1–12)*not regularly offered***TELECOMMUNICATION (TCM)****TCM 200 Fundamentals of Radio-Television. (3)***fall, spring, summer*

Structure of telecommunications in the United States: history, regulation, organization, with emphasis on broadcasting. Relationship to advertising, research, and government agencies. Prerequisites: MCO 110 (or 120); successful completion of English proficiency requirement.

TCM 201 Radio-Television Writing. (3)*fall, spring, summer*

Writing for electronic media, news, and continuity. Prerequisites: MCO 110 (or 120); successful completion of English proficiency requirement; demonstrated typing ability of 30 words per minute.

*General Studies: L***TCM 235 Production Techniques. (3)***fall, spring, summer*

Introduction to basic concepts of audio and video production. Introduces operation of portable cameras, recorders, microphones, lights, editing, and postproduction equipment. Prerequisites: TCM 200; successful completion of English proficiency requirement.

TCM 300 Advanced Broadcast Newswriting. (3)*fall and spring*

Technique and practice in newswriting for broadcast and cable applications. Prerequisites: TCM 201; professional program admission.

TCM 315 Broadcast News Reporting. (3)*fall and spring*

News and information practices of networks, stations, and industry. Practice in writing, reporting, and editing with emphasis on audio. Prerequisites: TCM 201; professional program admission.

*General Studies: L***TCM 330 Advanced Broadcast Reporting. (3)***fall and spring*

News and information practices of networks, stations, and industry. Advanced practice in writing, reporting, and editing with emphasis on video. Prerequisites: TCM 300; professional program admission.

TCM 332 Broadcast Programming. (3)*fall, spring, summer*

Programming theory and evaluation, regulation, ethics, and responsibilities and basics of audience psychographics and effects. Prerequisites: TCM 200; professional program admission.

TCM 433 Broadcast Sales and Promotion. (3)*fall and spring*

Basics of electronic media marketing practices, including commercial time sales techniques and radio/TV promotion fundamentals. Prerequisites: TCM 200; professional program admission.

TCM 435 Cable TV and Emerging Telecommunication Systems. (3)*fall and spring*

Structures and utilization of cable, industrial, and instructional television, satellite, and videocassettes. Prerequisites: TCM 200; professional program admission.

TCM 437 Advanced TV Production. (3)*fall and spring*

Emphasizes individual production projects of the student's own conception and design utilizing studio, field, and postproduction techniques. Prerequisites: TCM 235; professional program admission.

TCM 472 Broadcast Station Management. (3)*fall, spring, summer*

Management principles and practices, including organization, procedures, policies, personnel problems, and financial aspects of station management. Prerequisites: TCM 332; professional program admission.

TCM 475 Television Newscast Production. (3)*fall and spring*

Writing, reporting, and production of the television newscast. Capstone course of the broadcast journalism emphasis. Prerequisites: professional program admission; instructor approval.

School of Justice Studies**David Altheide***Interim Director***(WILSN 331) 480/965-7682****Fax 480/965-9199****www.asu.edu/copp/justice**

REGENTS' PROFESSOR**ALTHEIDE****PROFESSORS**

CAVENDER, FIGUEIRA-McDONOUGH, HAYNES, HEPBURN, JOHNSON, JURIK, LAUDERDALE, MUSHENO, ROMERO, SCHNEIDER, ZATZ

ASSOCIATE PROFESSORS

BORTNER, LUJAN, RIDING IN

ASSISTANT PROFESSORS

ADELMAN, BERNSTEIN, HANSON, MENJIVAR

MISSION

Students pursuing the B.S. degree in Justice Studies find an interdisciplinary classroom experience emphasizing ideas from the social sciences, philosophy, and legal studies. The degree is designed for students interested in studying issues of justice and those desiring justice-related careers, including law. Students develop an understanding of the meaning of justice and injustice, both descriptive and normative, and analyze often controversial issues through critical inquiry and social science investigation. The faculty focus on theories of justice and injustice in three principal areas:

1. crime and criminology;
2. law and society; and
3. social and economic justice.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Courses are designed to provide students with a comprehensive understanding of the substantive issues within each of these three areas and of the interrelationship and continuity among them. Students accordingly learn about conflict and its negotiation; crime and violence; adolescents and delinquency; punishment and alternatives to punishment; and differential institutional and socioeconomic treatment of populations based on gender and sexuality, race and ethnicity, and social class.

The heart of any university program is its faculty. The School of Justice Studies boasts a faculty with strong scholarly credentials. Faculty members include national and local award recipients in research, teaching, and public service. Faculty members are committed to challenging students to develop their own understandings of justice, to analyze critically, and to propose possible solutions to a wide variety of contemporary issues concerning social justice.

While completing the Justice Studies curriculum, students encounter opportunities to develop transferable skills, including critical thinking, oral and written discourse, computer literacy, and problem solving. Faculty encourage students to practice justice through various experiential approaches, including volunteer work, service learning, and internships. Students actively engage in their education via discussion, cooperative learning, field trips, and case-based classroom formats.

ADMISSION

Upon admission to the university, Justice Studies students are classified as premajors. Justice Studies students must earn major status before taking 400-level JUS resident credit courses.

Justice Studies students may achieve major status by (1) meeting the College of Public Programs major status admission requirements (see "Admission," page 466); and (2) completing all of the following classes with a 2.50 minimum average GPA and a minimum grade of "C" in each:

Choose between the course combinations below.....	6 or 3
ENG 101 First-Year Composition (3)	
ENG 102 First-Year Composition (3)	
-----or-----	
ENG 105 Advanced First-Year Composition (3)	
JUS 105 Introduction to Justice Studies	3
or JUS 305 Principles of Justice Studies (3)	
JUS 301 Research in Justice Studies	3
JUS 302 Basic Statistical Analysis in Justice Studies CS.....	3
JUS 303 Justice Theory	3
College writing competence requirement	3

ADVISING

Justice Studies students admitted as premajors are advised by one of the school's academic advisors. All students are encouraged to seek advising to formulate an appropriate educational plan.

Upon admission to the university, every Justice Studies undergraduate receives the *Undergraduate Advisement Guide* and an evaluation of transfer work, if any. For more information, call the school at 480/965-7682.

DEGREES

Justice Studies—B.S.

The curriculum for the B.S. degree in Justice Studies provides interdisciplinary social science courses relevant to law

and justice for students working in the justice field, students anticipating justice-related careers (including the legal profession), and interested non-Justice Studies students.

JUSTICE STUDIES MINOR

The minor is designed for students interested in developing an understanding of meanings of justice and injustice and analyzing often controversial issues through critical inquiry and social science investigation.

Fifteen hours of graded classroom JUS course work is required, including JUS 105 or 305 and JUS 303. No pass/fail or credit/noncredit course work may be applied to the minor. A minimum of nine semester hours must be resident credit at ASU Main, six hours of which must be upper-division credit. Students must receive a minimum grade of "C" for all courses in the minor and meet all course eligibility requirements, including prerequisites. Please consult the minor verification form available in the school office.

DEGREE REQUIREMENTS

The faculty in the School of Justice Studies award a B.S. degree upon the successful completion of a curriculum consisting of a minimum of 120 semester hours, including the university General Studies requirement, College of Public Programs requirements, justice studies courses, and electives. Additionally, the student must

1. earn major status;
2. earn a minimum of 45 semester hours of upper-division credits;
3. complete the school's minimum residency requirement of 24 semester hours (see the *Undergraduate Advisement Guide*);
4. earn a grade of "C" or higher in all justice studies courses taken at ASU that apply to the justice studies component of the curriculum (i.e., nonelectives); and
5. meet the university's residency and scholarship requirements.

GENERAL STUDIES REQUIREMENTS

To assure the breadth and depth of their education, all Justice Studies undergraduates must complete the university General Studies requirement and additional fundamental requirements prescribed by the College of Public Programs and the School of Justice Studies. For descriptive information on these requirements, see "General Studies," page 78. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses. The school implements the ASU continuous enrollment policy for First-Year Composition and the university mathematics (MA) requirement.

MAJOR REQUIREMENTS

The required justice studies component consists of 51 semester hours, of which 15 must be taken in a related field approved by the school. The following courses are required for all degree candidates. Equivalent courses may be substituted when appropriate.

JUS 105 Introduction to Justice Studies	3
or JUS 305 Principles of Justice Studies (3)	
JUS 301 Research in Justice Studies	3

JUS 302 Basic Statistical Analysis in Justice Studies CS.....3
 JUS 303 Justice Theory3
 Total12

Through advising, a group of justice studies courses may be recommended to ensure a comprehensive exposure appropriate to the student’s interests. The faculty encourage students interested in criminal justice issues and career areas to take JUS 100 The Justice System.

Electives. The faculty encourage students to utilize the unique opportunities afforded by the university to pursue personal and educational interests, whether in the form of a broad sampling of other disciplines or the deeper probing of a single field. Specifically, the faculty suggest that students take a minimum of one course in American government, behavioral psychology, and sociology.

Transfer of Community College Credits. Credits transferred from accredited community colleges are accepted as lower-division credits up to a maximum of 64 semester hours. The acceptance of credits is determined by the director of Undergraduate Admissions, and the utilization of credits toward degree requirements is determined by the faculty of the School of Justice Studies.

GRADUATE PROGRAMS

The faculty in the School of Justice Studies offer an M.S. degree in Justice Studies, which can be earned with a concurrent M.A. degree in Anthropology. The faculty in the School of Justice Studies are also the primary contributors to the interdisciplinary Ph.D. degree in Justice Studies. For more information, see the *Graduate Catalog*.

JUSTICE STUDIES (JUS)

JUS Note 1. For Justice Studies students to take a nonrequired 300-level JUS course, they must have at least a “C” in each of the required JUS courses—JUS 105 (or 305), 301, 302, and 303—and a minimum average GPA of 2.50 for these four classes. For non-Justice Studies students to take a 300-level JUS course, they must have a minimum of 56 earned semester hours (junior status) and a minimum cumulative GPA of 2.00. Non-Justice Studies students may take JUS 301, 302, and 303 with school approval.

JUS Note 2. For non-Justice Studies students to take a 400-level JUS course, they must have a minimum of 56 earned semester hours (junior status) and a minimum cumulative GPA of 2.50.

JUS 100 The Justice System. (3)

fall, spring, summer
 Overview of the justice system. Roles of law enforcement personnel, the courts, and correctional agencies. Philosophical and theoretical views in historical perspective.
General Studies: SB

JUS 105 Introduction to Justice Studies. (3)

fall, spring, summer
 Introductory overview to the study of justice from a social science perspective. Primary topics include justice theories and justice research. Credit is allowed for only JUS 105 or 305 (or AFR 305). Appropriate for freshmen and sophomores. Lecture, discussion. Cross-listed as AFR 105. Credit is allowed for only AFR 105 or JUS 105.

JUS 200 Topics in Concepts and Issues of Justice. (3)

once a year
 Uses critical thinking skills to analyze and comprehend controversial social issues (e.g., abortion, affirmative action, capital punishment, the flat tax, and immigration). May be repeated for credit when topics vary. Lecture, discussion.
General Studies: SB

JUS 294 Special Topics. (1–3)

fall, spring, summer
 Topics chosen from various fields of justice studies.

JUS 301 Research in Justice Studies. (3)

fall, spring, summer
 Focuses on developing and evaluating research designs, data collection, and the relationship between validity and reliability. Stresses methods for conducting research. Prerequisite: Justice Studies student.

JUS 302 Basic Statistical Analysis in Justice Studies. (3)

fall, spring, summer
 Introduction to the fundamentals and application of descriptive and inferential statistics, with emphasis in the justice area. Prerequisite: intermediate algebra or higher.
General Studies: CS

JUS 303 Justice Theory. (3)

fall, spring, summer
 Examines classic and contemporary philosophies and theories of justice, including legal, social, and criminal justice. See JUS Note 1.

JUS 305 Principles of Justice Studies. (3)

fall, spring, summer
 Introductory overview to the study of justice from a social science perspective. Primary topics include justice theories and justice research. Credit is allowed for only JUS 305 or 105 (or AFR 105). Appropriate for juniors and seniors. Lecture, discussion. Cross-listed as AFR 305. Credit is allowed for only AFR 305 or JUS 305. See JUS Note 1.

JUS 306 Police and Society. (3)

once a year
 Focuses on community policing; critical inquiry of administrative decision making; perspectives on police-citizen violence; street practices; urban policing. Lecture, discussion. See JUS Note 1.

JUS 308 Courts and Society. (3)

once a year
 History and development of courts. Relationship between dispute resolution mechanisms and cultural/social structure/processes in which they are embedded. Lecture, discussion, cooperative learning, case analysis. See JUS Note 1.

JUS 310 Corrections and Justice. (3)

once a year
 Examines the United States prison condition; types of offenders; issues including drugs, gangs, drunk driving, racial discrimination, and “intermediate” punishments. Lecture, discussion. See JUS Note 1.

JUS 311 Crime, Prevention, and Control. (3)

once a year
 Examines prevention and control of crime by a review of contemporary theories, justice agency procedures, and social policies. Lecture, discussion. See JUS Note 1.

JUS 320 Community and Social Justice. (3)

once a year
 Discusses and analyzes definitions of community; impact of environment on behavior; promises of community organization for local empowerment. Lecture, discussion. See JUS Note 1.
General Studies: SB, C

JUS 321 Wealth Distribution and Poverty. (3)

once a year
 Examines wealth and income distribution in the United States and analyzes ideological and political forces producing an increasingly unequal society. Lecture, discussion. Cross-listed as AFR 321. Credit is allowed for only AFR 321 or JUS 321. See JUS Note 1.
General Studies: SB, C

JUS 329 Domestic Violence. (3)

once a year
 Legal, historical, theoretical, and treatment aspects of domestic violence, including child abuse, woman battering, incest, and marital rape. Lecture, discussion. See JUS Note 1.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

JUS 335 Organized Crime. (3)*once a year*

Nature of organized crime and its illegal activities, theories of containment, and efforts by justice agencies to counter its dominance in society. Lecture, discussion. See JUS Note 1.

JUS 345 White Collar Crime. (3)*once a year*

Basic white collar concepts and categories; causes and effects; mechanisms and contexts of operation; social and criminological responses. Lecture, discussion. See JUS Note 1.

JUS 350 Immigration and Justice. (3)*fall, spring, summer*

Examines immigration policy, history of immigration, refugee issues, labor force participation, gender, family, children, social networks, and transnationalism. Lecture, discussion. See JUS Note 1.

*General Studies: SB, C***JUS 360 Law and Social Control. (3)***once a year*

Resolution of social issues through the application of law as an agent of social control. Nature, sanctions, and limits of law. Categories of law and schools of jurisprudence. Lecture, discussion. See JUS Note 1.

*General Studies: SB***JUS 365 Substantive Criminal Law. (3)***once a year*

Crimes against persons, property, and society; legislative analysis; primary appellate judicial opinions; substantive criminal law issues; trial court determinations. Lecture, discussion. See JUS Note 1.

JUS 368 Procedural Criminal Law. (3)*once a year*

Due process with respect to individual liberty; privacy and government power; emphasis on broad ideas of political and social theory. Lecture, discussion. See JUS Note 1.

JUS 375 Crime and the Mass Media. (3)*once a year*

Surveys the impact of mass media and popular culture on crime, police actions, and social policy. Lecture, discussion. See JUS Note 1.

*General Studies: SB***JUS 385 Justice and Everyday Life. (3)***once a year*

Justice and injustice in everyday life and how small things can become legal issues. Role of language and interaction in social order. Lecture, group work. See JUS Note 1. Prerequisites: JUS 105 (or 305), 301, 302, 303.

*General Studies: SB***JUS 394 Special Topics. (1–3)***once a year*

Topics chosen from various fields of justice studies. Lecture, discussion. See JUS Note 1.

JUS 404 Imperatives of Proof. (3)*once a year*

Issues of evidence, rules of proof, establishing fact and identity in the justice system. Lecture, case analysis, cooperative learning, discussion. See JUS Note 2.

*General Studies: L***JUS 405 Economic Justice. (3)***fall and spring*

Addresses economic issues and justice implications, including the interplay among economic conditions, race-ethnicity, class, and gender worldwide. Lecture, discussion. See JUS Note 2.

*General Studies: SB, G***JUS 410 Punishment: Logic and Approach. (3)***once a year*

Analyzes forms of punishment, how and why they have changed. Areas include philosophy, history, and social structure of punishment. Lecture, discussion. See JUS Note 2.

JUS 415 Gender and International Development. (3)*once a year*

Examines the ways in which international development is gendered as well as women's rights as human rights in both national and international arenas. Lecture, seminar. See JUS Note 2.

*General Studies: L, G***JUS 420 Women, Work, and Justice. (3)***once a year*

Examines gender inequality in the workplace, including the nature of women's work, theoretical issues, and models for promoting gender justice at work. Lecture, discussion. See JUS Note 2.

*General Studies: SB, C***JUS 422 Women, Law, and Social Control. (3)***once a year*

Examines social, economic, and legal factors that are relevant to mechanisms of social control of women, including formal legal control and informal control through violence. See JUS Note 2.

JUS 425 Race, Gender, and Crime. (3)*once a year*

Critically examines major theories, research findings, policies, and controversies concerning race, ethnicity, gender, and crime. Lecture, discussion, cooperative learning. See JUS Note 2.

*General Studies: L/SB, C***JUS 430 Social Protest, Conflict, and Change. (3)***fall, spring, summer*

Analyzes historical and contemporary protest movements advocating equality based on race, gender, and sexual orientation. Lecture, discussion. See JUS Note 2.

*General Studies: L/SB, C***JUS 440 Administration and Justice. (3)***once a year*

Diversity issues; procedural justice and service delivery; relationships between state and economic forces, including processes of regulation; state administrative apparatuses. Lecture, case analysis, cooperative learning, discussion. See JUS Note 2.

*General Studies: L***JUS 450 Alternatives to Incarceration. (3)***once a year*

Investigates various alternatives to incarceration; advantages/disadvantages; major issues including net widening, cost effectiveness, risk assessment, community crime prevention. Lecture, research. See JUS Note 2.

*General Studies: L***JUS 460 Feminism and Justice. (3)***once a year*

Explores feminist thought and critiques traditional political theories. Examines issues of racism, sexuality, and the law. Lecture, discussion. See JUS Note 2.

JUS 463 Discretionary Justice. (3)*once a year*

Use/abuse, key issues/manifestations of discretion in legal system and other societal institutions. Theoretical/empirical linkages between discretion and discrimination, based on race, ethnicity, and gender. Lecture, discussion. See JUS Note 2.

*General Studies: SB***JUS 465 Death Penalty in the United States. (3)***fall, spring, summer*

Focuses on capital punishment in the United States; explores negotiation of law, politics, morality, public policy, and culture. Lecture, discussion, case study. See JUS Note 2.

*General Studies: L***JUS 469 Political Deviance and the Law. (3)***once a year*

Examines the controversies created by political and deviant behavior, including a critical view of law as an agent of social control. Lecture, discussion. See JUS Note 2.

*General Studies: L/SB, C***JUS 470 Alternative Dispute Resolution. (3)***once a year*

Critical examination of the tenets of alternative dispute resolution movement; exposure to the programs of ADR, including community and court-based. Lecture, cooperative learning, field research. See JUS Note 2.

*General Studies: L/SB, C***JUS 474 Legislation of Morality. (3)***once a year*

Addresses historical and contemporary issues related to social justice movements, law, and morality in a pluralistic society. Issues include AIDS, burial rights, homosexuality, poverty, prostitution, and racial discrimination. See JUS Note 2.

General Studies: L/SB, C

JUS 477 Youth and Justice. (3)*once a year*

Critical examination of youth-related justice issues, including economic justice, violence against youth, delinquency, and the juvenile justice system. Lecture, group work, film. See JUS Note 2.

*General Studies: L/SB***JUS 479 Law and Disputing. (3)***fall and spring*

Critical analysis of the controversies created by disputes, law, and other forms of social control. Lecture, discussion. See JUS Note 2.

*General Studies: SB***JUS 484 Internship. (3–6)***fall, spring, summer*

Assignments in a justice-related placement designed to further the student's integration of theory and practice. Internships are arranged through consultation of students with placements. Students must consult with the school for appropriate application and registration procedures. May be repeated for credit for a total of 12 semester hours, of which a maximum of 6 are applied to the major. Fee. See JUS Note 2. Prerequisites: major status; Justice Studies student.

JUS 494 Special Topics. (1–3)*once a year*

Topics chosen from various fields of justice studies. Lecture, discussion. See JUS Note 2.

JUS 498 Pro-Seminar. (1–3)*fall, spring, summer*

Small group study and research for advanced students. May be repeated for credit for a total of 9 hours, of which a maximum of 3 are applied to the major. See JUS Note 2. Prerequisites: major status; minimum cumulative GPA of 3.00; instructor approval.

JUS 499 Individualized Instruction. (1–3)*fall, spring, summer*

Original study or investigation in the advanced student's field of interest under the supervision of a faculty member. May be repeated for credit for a total of 6 hours, all applicable to the major. Readings, conferences, tutorials. Prerequisites: major status; minimum GPA in JUS courses of 3.00; senior standing; instructor approval.

JUS 500 Justice Research Methods. (3)*once a year*

Theories and methods of research with emphasis on development of designs most relevant to justice data and problems.

JUS 501 Justice Theory. (3)*once a year*

Theories and philosophies of social, economic, political, and criminal justice. Applications of theories to contemporary justice issues. Lecture, discussion.

JUS 503 Crime and Social Causation. (3)*once a year*

Theories of deviance and crime as they relate to social policies and specific response of the justice complex.

JUS 509 Statistical Problems in Justice Research. (3)*once a year*

Methodological problems of research design and statistical methods specific to justice studies.

JUS 510 Understanding the Offender. (3)*once a year*

Survey of learning, personality, and biological theories of causation and their relevance to understanding criminal and delinquent behavior.

JUS 514 Justice Policy. (3)*once a year*

Assessment of the politics of justice policy as well as an understanding of the basic tools available to social scientists for analyzing the formulation, implementation, and evaluation of justice policy.

JUS 515 Comparative Justice. (3)*once a year*

Focuses on justice, legality, and human rights cross-culturally, examining both theoretical and methodological issues. Seminar.

JUS 520 Qualitative Theory and Data Collection. (3)*once a year*

Basic theoretical rationale and perspectives for justice-related qualitative research, e.g., symbolic interactionism. Techniques for data collection, e.g., ethnography and depth interviewing.

JUS 521 Qualitative Data Analysis and Evaluation. (3)*once a year*

Analysis of qualitative data, e.g., field notes, depth interview transcripts, document analysis, coding, and retrieval with a microcomputer; qualitative evaluation.

JUS 542 American Indian Justice. (3)*once a year*

Provides a broad overview of American Indian and Alaskan Native issues of justice and injustice in contemporary society.

JUS 547 Program Evaluation. (3)*once a year*

Nature/role of program evaluation; types, program monitoring, impact and process assessment, evaluability assessment, methods, utilization, and politics of evaluation. Lecture, lab. Pre- or corequisite: JUS 500 recommended.

JUS 550 Alternatives to Incarceration. (3)*once a year*

Investigates various alternatives to incarceration; advantages/disadvantages; major issues including net widening, cost effectiveness, risk assessment, community crime prevention. Lecture, research.

JUS 560 Women, Law, and Social Control. (3)*once a year*

Gender issues in the exercise of formal and informal mechanisms of social control, including economic, social, legal factors, both violent and nonviolent.

JUS 570 Juvenile Delinquency. (3)*once a year*

Study of delinquency, including causation theories. Alternative definitions of delinquency, official statistics, and the critique and analysis of the interaction between social institutions and youth.

JUS 571 Juvenile Justice System. (3)*once a year*

Graduate-level introduction to juvenile justice system, including historical development, philosophical orientation, organizational structure, and contemporary controversies.

JUS 575 Race, Gender, and Crime. (3)*fall and spring*

Current theoretical and methodological debates and controversies regarding race, ethnicity, gender, class, crime, and the criminal justice system; policy implications. Seminar.

JUS 579 Political Deviance. (3)*once a year*

Seminar examines the politics of deviance by integrating the study of conflict with aspects of social organization, especially state formation.

JUS 584 Internship. (3 or 6)*fall, spring, summer*

Assignments in a justice agency designed to further the student's integration of theory and practice. Placements are arranged through consultation with students and agencies. Fee.

JUS 588 Justice and the Mass Media. (3)*once a year*

Analyzes the nature and impact of mass media messages about justice concerns for social order. Lecture, discussion.

JUS 591 Seminar. (1–3)*once a year*

Topics chosen from various fields of justice studies. May be repeated for credit.

JUS 593 Applied Project. (1–12)*not regularly offered***JUS 610 Law and the Social Sciences. (3)***once a year*

Analyzes the theoretical grounds underlying diverse studies of law and society; creation and administration of law; and jurisprudence and politics.

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JUS 620 Justice Research and Methods. (3)*once a year*

Concept development, research design, data collection strategies, legal research, and building computer databases relevant to the study of justice.

JUS 630 Data Analysis for Justice Research. (3)*once a year*

Bivariate and multivariate techniques of data analysis and hypothesis testing for justice-related research and use of information and statistical programs.

JUS 640 Theoretical Perspectives on Justice. (3)*once a year*

Analyzes philosophical perspectives of justice; linkages between social science theory and justice constructs; application of justice to social issues.

JUS 650 Advanced Qualitative Data Analysis. (3)*spring*

Advanced qualitative data collection and analysis techniques, including ethnography, in-depth interviews, field notes, coding, transcribing, content analysis, textual analysis. Seminar.

JUS 669 Political Trials and Indigenous Justice. (3)*once a year*

Focuses upon research on political trials, deviance, and conceptions of indigenous and contemporary justice. Lecture, discussion.

JUS 691 Seminar. (1-3)*fall, spring, summer*

Topics chosen from various fields of justice studies. May be repeated for credit.

School of Public Affairs

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ASSOCIATE PROFESSORS

ALOZIE, BROWN, CAMPBELL, DeGRAW, LAN

ASSISTANT PROFESSORS

DeLORENZO, McCABE

DISTINGUISHED RESEARCH FELLOW

PFISTER

The faculty in the School of Public Affairs offer an undergraduate public administration concentration of 18 semester hours of course work within the Bachelor of Interdisciplinary Studies program. The school also offers a 15-semester-hour Public Administration and Public Management Certificate program. The certificate prepares students for citizenship, leadership, and careers in governmental agencies and nonprofit associations. To meet certificate requirements, students take four core courses (PAF 300, 340, 420, and 460) and one elective course. The list of approved electives may be obtained by visiting the School of Public Affairs Student Services Office in WILSN 225A, or by calling 480/965-1037.

Public Administration and Management Certificate

PAF 300 Public Management and Administration.....	3
PAF 340 Public Management and Policy	3
PAF 420 Public Leadership.....	3
PAF 460 Public Service Ethics	3
Elective.....	3
Total	15

The school also offers a 42-semester-hour professional Master of Public Administration degree and the Doctor of Philosophy degree. The M.P.A. degree is accredited by the National Association of Schools of Public Affairs and Administration. Consult the *Graduate Catalog* for information about the programs.

PUBLIC AFFAIRS (PAF)

PAF 300 Public Management and Administration. (3)

fall and spring

Examines the context and role of the public manager and the development of the field of public administration.

PAF 340 Public Management and Policy. (3)

fall and spring

Develops conceptual, critical, and practical understanding of policy, the policy process, and policy analysis.

PAF 401 Statistics. (3)

fall and spring

Surveys statistical concepts and techniques with application to public administration. Does not count toward program of study. Satisfies statistics prerequisite requirement for PAF 501 and 502.

PAF 420 Public Leadership. (3)

fall and spring

Examines key concepts, models, and strategies for leading public and nonprofit organizations, emphasizing self-knowledge, skills, and abilities for effective leadership.

PAF 460 Public Service Ethics. (3)

fall and spring

Role, values, and issues of public management in democratic governance, citizen participation, power structures, and professional codes of conduct.

PAF 501 Public Service Research. (3)

fall and spring

Philosophy, scope, and methods; public service research design, values, and ethics. Prerequisite: an approved course in statistics.

PAF 502 Computer Applications. (3)

fall and spring

Computer applications in public affairs; software packages for data analysis, decision making, information dissemination, and problem solving. Prerequisite: PAF 501.

PAF 503 Public Affairs. (3)

fall and spring

Development and context of American public administration and policy, role of administration in governance, and values and ethics in administration.

PAF 504 Public Affairs Economics. (3)

fall and spring

Basics of public sector economics, microeconomic and macroeconomic concepts applied to public sector decisions and policies.

PAF 505 Public Policy Analysis. (3)

fall and spring

Institutional and formal analysis of policy processes, decision making, and problem solving; values, ethics, and the uses of policy analysis. Prerequisites: PAF 504; satisfaction of the statistics requirement.

PAF 506 Public Budgeting and Finance. (3)

fall and spring

Legal, social, economic, political, institutional, and ethical foundations of governmental finance, budgets, and budgeting. Prerequisites: PAF 502, 504.

PAF 507 Public Human Resource Management. (3)

fall and spring

Personnel systems, behavior and management of people in public organizations, collective behavior, unionism, conflict management, motivation, productivity, and ethics.

PAF 508 Organization Behavior. (3)*fall and spring*

Theory and application in the management of organizational behavior with emphasis on leadership and the public service.

PAF 509 Public Service. (3)*fall and spring*

Capstone application of core course knowledge, skills, and abilities required for public service. Prerequisites: PAF 501, 502, 503, 504, 505, 506, 507, 508.

PAF 510 Governmental Budgeting. (3)*not regularly offered*

Theories, applications, and consequences of budget decision making. Prerequisite: PAF 504.

PAF 511 Governmental Finance. (3)*not regularly offered*

Sources of funding, management of funds and debts, and general pattern of expenditures in states, counties, cities, and districts. Prerequisite: PAF 504.

PAF 520 Public Management. (3)*not regularly offered*

Management process in government and public agencies, with emphasis on the executive leadership within the public sector.

PAF 521 Organization Theory. (3)*not regularly offered*

Organization theory and current research emphasis with application to public administrative organizations.

PAF 522 Public Labor Relations. (3)*not regularly offered*

Rise of public unionism, managerial policy toward unionism, conflict resolution; impact of unionism on budgets, personnel policies, and public policy.

PAF 523 The City and County Manager. (3)*once a year*

Manager's role and resources in the differing forms of administrative, legislative, and community sectors.

PAF 525 Public Program Management. (3)*not regularly offered*

Governmental service programming: formulating, financing, operating, evaluating, and reporting. Analyzes interagency relationships and the role and conduct of research in the programming process.

PAF 526 Public Sector Human Resource Development. (3)*not regularly offered*

Concepts and techniques of organizational development in the public sector, including staffing, supervisor training, executive development, resource planning, and employee training.

PAF 529 Organization Change and Development. (3)*not regularly offered*

Explores the nature and management of change and development as a tool to achieve organizational goals; effecting planned change.

PAF 530 Management of Urban Government. (3)*not regularly offered*

Administrative practices and behavior within the urban political administrative environment. Functional areas such as citizen participation, urban planning, urban transportation, and the conflicts between urban politics and administrative efficiency.

PAF 531 Community Conflict Resolution. (3)*not regularly offered*

Interdisciplinary approach to understanding the dynamics of community conflict. Strategic considerations in policy design and advocacy; potential reaction to conflict. Relevant models and research findings generated by both case studies and comparative methods.

PAF 532 Urban Planning Administration. (3)*not regularly offered*

Historical and present-day uses of urban planning and procedures for its implementation. Basic principles and practices.

PAF 533 Urban Growth Administration. (3)*not regularly offered*

Examines the process of urban growth and change. Emphasizes partnership roles played by public and private sectors in management.

PAF 535 Urban Housing Policy. (3)*not regularly offered*

Comprehensive consideration of the revitalization of American cities with major emphasis upon the housing process and related institutions and services.

PAF 536 Urban Policy Making. (3)*not regularly offered*

Analyzes the opportunities and costs of influencing public policy and the roles of officials and bureaucracies in decision making.

PAF 540 Advanced Policy Analysis. (3)*once a year*

Emphasizes the structure of policy problems, forecasting policy alternatives, optimizing resources, and reducing uncertainty in policy making. Prerequisite: PAF 505 or instructor approval.

PAF 541 Program Evaluation. (3)*not regularly offered*

Various methodologies available for the evaluation of public policies and programs. Prerequisite: PAF 501 or instructor approval.

PAF 546 Environmental Policy and Management. (3)*not regularly offered*

Analyzes environmental policy and planning issues and principles related to the analysis and management of natural and urban/regional resources.

PAF 547 Science, Technology, and Public Affairs. (3)*not regularly offered*

Influence of science and technology on governmental policy making, scientists as administrators and advisors, governmental policy making for science and technology, government as a sponsor of research and development.

PAF 548 Women, Politics, and Public Policy. (3)*not regularly offered*

Explores how political philosophy, politics, and public policy affect and are affected by women.

PAF 549 Diversity Issues and Public Policy. (3)*not regularly offered*

Examines public policy issues concerning or affecting women, black, Latino, Asian, and American Indian communities, as well as those groups' impact on the policy process.

PAF 550 Information Management. (3)*not regularly offered*

Concepts and theory of information and information technology in public sector organizations.

PAF 551 Computers in Administration. (3)*not regularly offered*

Experience in use of computer technology for public administration problem solving.

PAF 552 Public Information Systems. (3)*not regularly offered*

Systems analysis concepts and theory as applied to administration. Alternative modes of information organization and their impact on public decision making.

PAF 555 Research Data Management. (3)*not regularly offered*

Techniques and problems associated with data management in a research environment. Database management systems, security and integrity, accessibility, and cost.

PAF 556 Database Management Systems. (3)*not regularly offered*

Concept and use of modern database management systems in an administrative organization. Advantages and disadvantages of this approach.

PAF 561 Comparative Administration. (3)*not regularly offered*

Literature on comparative public administration theory. Bureaucracies and their impact on the political development process. Studies selected nations.

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PAF 562 Intergovernmental Relations. (3)*once a year*

Evolution, growth, present status, and characteristics of the U.S. federal system of government. Federal-state relations, state-local relations, regionalism, councils of government, interstate cooperation, grants-in-aid, and revenue sharing.

PAF 563 Report Preparation. (3)*not regularly offered*

Intensive practice in written and oral presentation of reports to conferences with problems in public administration. Visual aid techniques.

PAF 564 Political Economy. (3)*once a year*

Classical and contemporary literature and historical development of governmental and economic arrangements, with special emphasis on the role of the state.

PAF 591 Seminar. (1–12)*fall and spring*

Possible topics:

- (a) Business and Government
- (b) Emergency Management
- (c) General Public Administration
- (d) Information Management
- (e) Public Finance Administration
- (f) Public Management
- (g) Public Policy Analysis
- (h) Urban Affairs and Urban Planning

PAF 600 Research Design and Methods. (3)*once a year*

Advanced methods of research design and data collection. Prerequisites: formal graduate-level course work in statistics and in research methods.

PAF 601 Seminar: Policy Analysis and Evaluation. (3)*once a year*

Normative and conceptual issues of policy formulation, implementation, and evaluation; methods of policy analysis and evaluation.

PAF 602 Seminar: Foundations of Public Administration. (3)*once a year*

Ethical, social, legal, and philosophical foundations of public administration.

PAF 603 Seminar: Organization and Behavior in the Public Sector. (3)*once a year*

Structure, organization, conduct, and performance of public sector institutions in the administration of public policy. Prerequisite: PAF 602.



Sunshine and study go hand in hand at ASU year-round.

Tim Trumble photo

Department of Recreation Management and Tourism

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MARTINEZ, PRITCHARD, SONMEZ, TIMOTHY

RECREATION—B.S.

The B.S. degree program in the Department of Recreation Management and Tourism centers upon the systematic study of leisure-related phenomena, including human behavior and development, resource use, environmental and social issues, and public policy. It is a professional program that features full exposure of students to a multifaceted concept of leisure and the quality preparation of these students for professional-level entry into leisure service occupations.

This multidisciplinary degree program is designed to provide the student with the competencies necessary for employment in management and program delivery positions in diverse leisure agencies such as municipal recreation and park departments, county park departments, YMCAs, YWCAs, Boys and Girls Clubs of America, and other nonprofit agencies, visitor and convention bureaus, senior centers, retirement communities, resorts, clinical rehabilitation centers, hospitals, destination management companies, and other components of the tourism/commercial recreation industry. Graduates have also been employed by state offices of tourism, state parks departments, various federal recreation resource agencies, and professional sports arenas.

Concentrations

Students may select from two concentrations: (1) recreation management and (2) tourism.

Recreation Management. Students pursuing the recreation management concentration can further specialize in therapeutic recreation, community and urban recreation, outdoor recreation, or nonprofit/youth agency administration (American Humanics). In addition to the 33 semester hours of major core classes, these concentrations consist of 15 semester hours of recreation-related courses and 15 semester hours of related-areas courses.

Therapeutic Recreation. Within the recreation management concentration, students may specialize in therapeutic recreation and in doing so, may qualify to sit for the National Council for Therapeutic Recreation Certification exam. This professional development prepares students for careers in clinical and community settings, working with disabled individuals in their pursuit of quality leisure experiences.

This program is the only one of its kind in a growing field in Arizona.

Tourism. The tourism concentration consists of 33 semester hours of major core courses, nine semester hours of tourism-related requirements, nine semester hours of tourism options, and 12 semester hours of nonmajor related course work.

Tourism students may choose to follow either the marketing and community development track or the services track for their related course work. Information on these tracks is available from the academic advisor.

DEPARTMENTAL MAJOR REQUIREMENTS

Students may declare Recreation as their major but cannot register for upper-division core classes without *professional status*. To be officially admitted with professional status to the B.S. degree program in Recreation, students must

1. meet the College of Public Programs major status admission requirements (see “Admission,” page 466);
2. complete REC 120 and 210 with a grade of “C” or higher;
3. complete either COM 225, 241, or 259; and
4. have a “C” or higher in ECN 112, if pursuing the tourism concentration.

Transfer students who have completed 56 semester hours or more at another institution must remove any of the above course or scholastic deficiencies before being admitted *with professional status* to the B.S. degree in Recreation.

To graduate, students must complete the university General Studies requirement and the College of Public Programs course requirements in addition to major requirements.

PROGRAM REQUIREMENTS

The 63-semester-hour B.S. degree in Recreation includes 33 semester hours of major core courses, which must be taken on the ASU Main campus.

Recreation Major Core Courses

REC 120 Leisure and the Quality of Life <i>SB</i>	3
REC 210 Leisure Delivery Systems	3
REC 330 Programming of Recreation Services <i>L</i>	3
REC 350 Promoting and Marketing Recreation Services	3
REC 364 Foundations of Therapeutic Recreation	3
REC 462 Management of Recreation Services	3
REC 463 Senior Internship	12
REC 482 Assessment and Evaluation of Recreation Services	3
Total	33

REC 330, 350, 462, and 482 require *professional status* and must be taken in sequence. REC 463 is the final capstone course taken in the department.

Two hundred hours of recreation leadership experience are required before enrollment in REC 463 Senior Internship. Students are not permitted to take additional course work during their senior internship placement period. Approval of internships for ASU Main students must be

received from the Department of Recreation Management and Tourism office at ASU Main.

A student must attain a grade of “C” or higher in all courses within the major, including the related area. Specific courses that may be used to fulfill the related requirements are listed on check sheets available in the department office.

In both the recreation management and tourism concentrations, the related areas and directed electives course work must be selected from a departmental list of approved university courses.

MINORS

The department offers minors in Recreation Management and in Tourism. The minor in Recreation Management consists of REC 120 Leisure and the Quality of Life, REC 160 Leisure and Society, and 15 additional semester hours of approved course work, including 12 semester hours at the upper-division level, from ASU Main. The Tourism minor consists of REC 120 Leisure and the Quality of Life and 12 additional semester hours of upper-division approved courses from ASU Main.

CERTIFICATE PROGRAM

Nonprofit/Youth Agency Administration: American Humanics Certificate Program. The certificate program in American Humanics is education and preparation for leadership and management positions in nonprofit youth and human service organizations. The program features professional affiliation with and certification by American Humanics, Inc., the nation’s leader in education for nonprofit careers. American Humanics collaborates with several nonprofit organizations, including American Red Cross, Big Brothers/Big Sisters, Boys and Girls Clubs, Boy Scouts, Camp Fire Boys and Girls, Girl Scouts, Habitat for Humanity, Junior Achievement, the United Way, YMCA, and YWCA.

This program features an academic and experiential approach that highlights the unique issues of nonprofit organization management, with a particular emphasis in youth development agencies. The program includes active participation by nonprofit professionals who offer workshops, seminars, mentoring, and field trips. American Humanics national certification can be earned in conjunction with any baccalaureate degree.

REC 220 Introduction to Nonprofit Youth and Human Service Agencies	3
REC 300 Fund Raising	3
REC 310 Volunteerism	3
REC 320 Youth and Human Service Workshop*	4
REC 420 American Humanics Institute	2
REC 430 Managing Nonprofit Agencies	3
REC 463 Senior Internship	12
Minimum total	30

* REC 320 is taken four semesters, for one semester hour each term.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

GRADUATE PROGRAM

M.S. Degree in Recreation. The curriculum for the M.S. degree in Recreation is designed to help students achieve both academic and professional goals. Areas of study include outdoor recreation, recreation administration, social/psychological aspects of leisure, and tourism and commercial recreation. Students may complete a thesis or professional option. Information on the M.S. degree in Recreation is detailed in the *Graduate Catalog*.

RECREATION MANAGEMENT AND TOURISM (REC)

REC 120 Leisure and the Quality of Life. (3)

fall, spring, summer

Conceptual foundations for understanding the role of leisure in the quality of life. Social, historical, psychological, cultural, economic, and political foundations of play, recreation, and leisure.

General Studies: SB

REC 150 Outdoor Pursuits. (3)

summer

Theories and practical applications related to outdoor recreation pursuits. Interdisciplinary approach to wilderness issues and philosophies, culminating in an outdoor experience. Field trip required.

REC 160 Leisure and Society. (3)

once a year

Analyzes the human relationship to leisure. Historical survey of philosophical, psychological, and socioeconomic bases for development of systems that provide leisure programs. Non-Recreation majors only.

General Studies: SB

REC 210 Leisure Delivery Systems. (3)

fall and spring

Introduction to development, management, and organization of the public, not-for-profit, and private sectors of the leisure services profession. Organized into five modular units that study the delivery of services in the recreation and tourism professions. Lecture, team taught. Prerequisite: Recreation major. Pre- or corequisite: REC 120.

REC 220 Introduction to Nonprofit Youth and Human Service Agencies. (3)

fall and spring

Introduction to the not-for-profit youth and human service sector and its role in United States society, the economy, and service delivery systems.

REC 230 Camp Administration. (3)

spring

Historical and philosophical foundations of the organized camping movement in America; trends and issues; camp administration and leadership.

REC 235 Service Learning for Youth Development. (3)

fall and spring

Applies youth development theories and approaches through a community service immersion in collaboration with one or more nonprofit partners. Case studies, small group discussion. Prerequisite: instructor approval.

REC 300 Fund Raising. (3)

once a year

Methods, techniques, and directed experience in fund raising for voluntary youth and human services agencies. Budget control and accountability.

REC 305 Introduction to Travel and Tourism. (3)

fall and spring

Examines the components of the travel and tourism industry at the state, national, and global levels.

General Studies: G

REC 310 Volunteerism. (3)

once a year

Administration of volunteer service programs. Studies and analyzes the volunteer personnel process.

REC 315 Community Recreation Systems. (3)

spring

Explores and assesses community recreation delivery systems in the United States. Prerequisite: REC 210.

REC 320 Youth and Human Service Workshop. (1)

fall and spring

Professional seminar featuring nonprofit executives; variable topics on nonprofit and youth leadership. Forum for exchange between students and professionals. May be repeated for credit. Prerequisite: instructor approval.

REC 325 Tourism Accommodations. (3)

once a year

Local, national, and international overview of the lodging and food service industries. Prerequisites: REC 305; Recreation major or minor.

REC 330 Programming of Recreation Services. (3)

fall and spring

Foundations for effective program planning in varied leisure delivery systems. Prerequisite: Recreation professional status.

General Studies: L

REC 340 Outdoor Survival. (3)

once a year

Interdisciplinary approach to outdoor survival, including attitudes, psychological stress, physiological stress, preparation, hypothermia, navigation, flora, and wildlife. Field trips required.

REC 345 Meeting and Convention Planning. (3)

once a year

Basic aspects and skills in planning meetings and conventions. Industry and market overview of certified meeting planners. Prerequisite: REC 305.

REC 350 Promoting and Marketing Recreation Services. (3)

fall and spring

Basic principles of promoting recreation services and strategies focusing on promoting and marketing concepts as they apply to recreation/tourism settings. Prerequisite: Recreation professional status.

REC 364 Foundations of Therapeutic Recreation. (3)

fall and spring

Introduction to special recreation and therapeutic recreation services for persons with disabilities. Offers both a community and clinical perspective on specialized services. Prerequisite: Recreation professional status or instructor approval.

REC 370 Outdoor Recreation Systems. (3)

fall

Introduction to outdoor recreation resource delivery systems; history of wilderness and outdoor recreation resources; the role of outdoor recreation in society; outdoor recreation agencies; related environmental issues. Prerequisite: junior standing or instructor approval.

REC 372 Tourism Planning. (3)

fall and spring

Applies economic and regional development concepts and theories to destination product development. Prerequisites: REC 305; Recreation major or minor.

REC 380 Wilderness and Parks in America. (3)

fall and spring

Examines the American Conservation Movement and the relationships between the environment and recreation behavior.

General Studies: SB, H

REC 390 Adaptive Aquatics. (3)

not regularly offered

Focuses on delivery of aquatic programs for the mentally and physically challenged. Lecture, lab.

REC 400 Processes and Techniques in Therapeutic Recreation. (3)

once a year

In-depth analysis of theoretical and philosophical approaches to therapeutic recreation practice with emphasis on various facilitation techniques used in therapy. Prerequisite: REC 364 or instructor approval.

REC 401 Program Design and Evaluation in Therapeutic Recreation. (3)

fall and spring

In-depth analysis of assessment, treatment planning, program implementation, documentation, and evaluation strategies employed in therapeutic recreation practice. Prerequisites: both REC 364 and 400 or only instructor approval.

REC 415 Tourism Transportation Systems. (3)

once a year

Examines the role of various modes of transportation in domestic and international tourism development. Prerequisites: REC 305; Recreation major or minor.

REC 420 American Humanics Institute. (1–2)*fall and spring*

National Management Institute for preparation of youth development and nonprofit professionals. Out-of-state conference includes seminars and case studies. May be repeated for credit. Prerequisite: instructor approval.

REC 430 Managing Nonprofit Agencies. (3)*spring*

Analyzes administrative structure, decision making, and program delivery with not-for-profit youth and human service agencies. Prerequisites: REC 220; senior standing.

REC 440 Recreation Areas and Facilities Development and Management. (3)*once a year*

Survey of development and management of public, private, and commercial recreation areas and facilities with a focus on meeting program needs.

REC 458 International Tourism. (3)*fall and spring*

Global examination of international tourism and its significance as a vehicle for social and economic development.

*General Studies: G***REC 460 Clinical Issues in Therapeutic Recreation. (3)***once a year*

Explores contemporary problems/issues confronting the therapeutic recreation field; includes philosophical, historical, practice, management, research, and educational issues. Lecture, off-campus lab. Prerequisites: both REC 364 and 400 or only instructor approval.

REC 462 Management of Recreation Services. (3)*fall and spring*

Basic principles of administration and their application in successful administrative situations. Analyzes administrative function, structure, and policies. Prerequisites: REC 330; Recreation professional status.

REC 463 Senior Internship. (6 or 12)*fall, spring, summer*

Supervised guided experience in selected agencies. Fee. Prerequisites: REC 462; Recreation major; senior standing.

REC 470 Environment Interpretation and Education. (3)*fall*

Introduction to park interpretation and environmental education that includes theories, principles, and techniques.

REC 480 Natural Resource Tourism. (3)*spring*

Examines the interaction of tourism with culture, natural environment, as well as the impacts of tourism on the environment.

REC 482 Assessment and Evaluation of Recreation Services. (3)*fall and spring*

Introduction to applied leisure research with emphasis on program evaluation, research design, data collection techniques, and data analysis. Prerequisites: REC 330, 350; Recreation professional status.

REC 494 Special Topics. (1–3)*fall and spring*

Special topics selected by department faculty.

REC 500 Research Methods. (3)*once a year*

Introduction to recreation research methods, with emphasis on methodological questions, research issues, and techniques relevant to contemporary social research. Prerequisite: 500-level or higher approved statistics course.

REC 501 Program Evaluation and Information Management. (3)*not regularly offered*

Develops skills in several professional areas, including: evaluation, needs assessment, information and data collection, data management/analysis, computer applications, and report writing.

REC 530 Recreation and Tourism Service Management. (3)*spring in even years*

Examines and applies organizational behavior, leadership, human resources, and development; planning and risk management to profession.

REC 552 Foundation of the Recreation and Tourism Professions. (3)*once a year*

Examines the philosophical and conceptual foundations of play, leisure, recreation and tourism; history of the profession; professional and research issues.

REC 555 Social and Psychological Aspects of Recreation and Tourism Behavior. (3)*once a year*

Theoretical review and empirical analysis of social, cultural, and psychological foundations of leisure behavior with practical implications.

REC 558 Integrative Seminar. (3)*once a year*

Advanced exploration and assessment of current trends within the leisure studies profession. Variable topics, including, but not limited to: cross-cultural analysis of leisure, urban recreation, planning and resources, sociocultural dimensions of tourism development, wilderness management. Prerequisite: REC 552.

REC 569 Current Issues in Tourism. (3)*once a year*

General survey of tourism literature with emphasis on relevant theories, concepts, and current research.

REC 570 Social Aspects of Outdoor Recreation Management. (3)*once a year*

Analyzes the social aspects of natural resource recreation management and planning. Prerequisite: REC 370 (or its equivalent).

REC 580 Practicum. (1–12)*not regularly offered***REC 593 Applied Project. (1–12)***not regularly offered***REC 598 Special Topics. (1–12)***not regularly offered***REC 599 Thesis. (1–12)***not regularly offered*

School of Social Work

Leslie Leighninger
Director
 (WHALL 135) 480/965-3304
 Fax 480/965-5986
 ssw.asu.edu

PROFESSORS

ASHFORD, COUDROGLOU, DALEY, KETTNER, LeCROY,
 LEIGHNINGER, MacEACHRON, MARTINEZ-BRAWLEY,
 MORONEY, SEGAL

ASSOCIATE PROFESSORS

BRZUZY, GERDES, GUSTAVSSON, MARSIGLIA,
 MONTERO, NICHOLS, PAZ, RISLEY-CURTISS,
 STEINER, WALLER, YELLOW BIRD

ASSISTANT PROFESSORS

HOLLEY, HOLSCHUH, HURDLE, LARSON, NAPOLI,
 OKAMOTO, STROMWALL

ACADEMIC PROFESSIONALS

GONZALEZ-SANTIN, JOHNSTON, KNUTSON-WOODS,
 ROUNTREE-ANTAR, YEPEZ

PURPOSE

The purpose of the School of Social Work is to prepare professional social work practitioners who are committed to the enhancement of individual family and group problem-solving capacities and the creation of a more nurturing, just, and humane social environment.

The mission of the School of Social Work is the training of professional social workers for beginning-level generalist practice (B.S.W.) and for advanced direct practice and planning, administrative, and community practice (M.S.W.). The focus is on populations of the Southwest and those who are most oppressed and most in need of social services.

The school is committed to the university's mission to be competitive with the best public research universities in the country. Faculty members have active research agendas under way that venture into a wide variety of topics, including work with children, Latino and American Indian issues, poverty, human services planning, and many other areas of interest.

ORGANIZATION

The School of Social Work is organized around three program areas:

1. Bachelor of Social Work (B.S.W.);
2. Master of Social Work (M.S.W.); and
3. Doctor of Philosophy (Ph.D.) with a major in Social Work.

The M.S.W. program has two areas of concentration in the second year: (1) advanced direct practice (ADP) and (2) planning, administration, and community practice (PAC). In considering the PAC area of emphasis, students need to be aware that, because of space availability, preference is given to individuals with significant previous experience.

For more information regarding the master's and Ph.D. programs, see the *Graduate Catalog*.

ADMISSION

Bachelor of Social Work

The B.S.W. degree program is divided into the pre-Social Work major and the Social Work major.

The pre-Social Work major consists of freshman and sophomore students who have been admitted to the university and have declared Social Work as their major, as well as students transferring to the School of Social Work from other majors within the university and other universities or community colleges who have not completed the admission requirements to the program. Students transferring from other universities or community colleges as premajors should follow the procedure outlined under "Transfer Credit," page 57. Students transferring from other colleges within the university must obtain a Change of College form from the School of Social Work, Academic Services, WHALL 135.

Admission Procedure for Social Work Majors. This admission procedure is for students who have 56 semester hours or more and have taken SWU 271 Introduction to Social Work, 291 Social Service Delivery Systems, 301 Human Behavior in the Social Environment I, and 310 Social Work Practice I. Students wishing to enter the Social Work major are required to apply for admission to the program in addition to obtaining an official Certificate of Admission to the university. Students are eligible to apply for admission to the Social Work major during the last semester of the sophomore year. It is expected that applicants have completed 56 semester hours and the required social work courses by the end of the semester in which they are applying. Students are admitted to the major at the beginning of the term following the semester during which they apply.

Students may obtain a Social Work major application packet at the School of Social Work, Academic Services, WHALL 135, or request that one be mailed to their home address by calling 480/965-6081.

Applications are reviewed for admission for the fall and spring semesters. Students applying must have a Certificate of Admission to the university in their files by November 1 for spring admission and March 1 for fall admission. All other application materials (i.e., application form, additional statement, and two letters of reference) must be returned to

SCHOOL OF SOCIAL WORK
 ACADEMIC SERVICES
 ARIZONA STATE UNIVERSITY
 PO BOX 871802
 TEMPE AZ 85287-1802

Materials must be received by November 1 for spring admission or March 1 for fall admission. Failure to meet these deadlines may result in the applicant having to wait for the next admissions period. Applicants are notified by mail of the committee's decision. Those applicants who have been denied admission may request a conference with the B.S.W. program coordinator to discuss the decision and to obtain guidance in the development of future plans.



Wide pedestrian malls provide easy access to campus locations.

Jean Laaninen photo

Criteria for Admission. Social Work majors may achieve admission as a major by meeting the College of Public Programs major status admissions requirements.

Admission is also based on the following criteria:

1. A minimum of 56 semester hours with a cumulative GPA of at least 2.50 at ASU is required.
2. A minimum cumulative GPA of 2.75 in core social work courses (SWU 271, 291, 295, 301, and 310) and a grade of “C” or higher in all social work courses are required.
3. The applicant’s educational and career goals must be compatible with the educational objectives of the school.
4. Before admission to the major, it is required that students have had human service experience for a minimum of 240 hours in social work–related settings. Personal life experience may be substituted.
5. References are required for each applicant. One reference should be from a person who knows the applicant in a professional capacity and one from a person who knows the applicant in an academic capacity. Additionally, a third reference is later requested by the school from the applicant’s SWU 310 instructor. This reference is used in the field placement process.

Admission is selective and based on available resources. Not all students who meet minimum requirements are admitted to the program.

For more information, see “Admission,” page 466.

Leave of Absence. Occasionally, for health or personal reasons, Social Work majors find it necessary to interrupt their

studies. Students considering such requests meet with an academic advisor to look at alternatives and then submit a written request to the B.S.W. program coordinator. A student may request a leave of absence from the Social Work program for a period of one year. (This leave applies only to the Social Work program and not to the university. No leave of absence is granted from the university.) Except when recommended by the Committee on Academic and Professional Standards, the student must be in good standing in the program at the time the request is made. Students should be aware that nonattendance at the university for one or more semesters requires reapplication to the university. Failure to request a leave of absence by Social Work majors results in removal from the program.

Readmission. Undergraduate students (premajor and major) who have previously attended ASU but have not been enrolled at this institution for one or more semesters are required to apply for readmission following university procedures as outlined under “Readmission to the University,” page 65. Students who were previously Social Work majors may, in addition, be required to reapply for major status.

Transfer Students. The university standards for evaluation of transfer credit are listed under “Transfer Credit,” page 57. Community college students planning to transfer at the end of their first or second year should plan their community college courses to meet the requirements of the ASU curriculum selected. Students attending Arizona community colleges are permitted to follow the degree requirements specified in the ASU catalog in effect at the time they begin their community college work, providing their college attendance

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

is continuous. See “Guidelines for Determination of Catalog Year,” page 74.

Arizona students are urged to refer to the *Course Applicability System* for the transferability of specific courses from Arizona community colleges. Copies of the guide are available from Academic Services, WHALL 135. Students may also access the guide through the Academic Transfer Articulation Office’s Web site at www.asu.edu/provost/articulation.

Courses transferred from community colleges are accepted as lower-division credit only. Students are urged to choose their community college courses carefully, in view of the fact that there is a minimum number of hours of work taken at the university that must be upper-division credit (see “Credit Requirements,” page 74).

Direct transfer of courses from other accredited institutions to the School of Social Work is subject to the existence of parallel and equal courses in the school’s curriculum. Transfer credit is not given for courses in which the lowest passing grade (“D”) or a failing grade (“E” or “F”) was received.

Credit for “life experience” is not given in lieu of course requirements. A minimum of 30 semester hours earned in resident credit courses at ASU is required for graduation.

ADVISING

Students are responsible for meeting the degree requirements and seeking advising regarding their program status and progress. Upon admission to the Social Work major, each student is assigned a faculty advisor who assists with career planning. The academic advisor assists students with program planning, registration, preparation of needed petitions, verification of graduation requirements, and referrals to university and/or community resources. Students must meet with an academic advisor before any registration transaction.

DEGREES

The school’s undergraduate curriculum leads to a Bachelor of Social Work (B.S.W.) degree. The B.S.W. degree program is accredited by the Council of Social Work Education (CSWE). The principal objective of the undergraduate curriculum is to prepare students for beginning-level generalist practice in social work. The program is also designed to prepare students for culturally sensitive practice and to provide preparation for graduate training in social work. During the freshman and sophomore years, students concentrate on obtaining a strong background in liberal arts and sciences and are classified as premajors until they are officially admitted to the major. Entrance into the Social Work major from the premajor is not automatic (see “Admission,” page 466).

Junior and senior Social Work majors focus on social work courses in research, social policy and services, social work practice, human behavior in the social environment, and field instruction in community agencies. In addition, majors take elective courses in related areas.

The B.S.W.-level practitioner is seen as a generalist. The curriculum focuses on such roles as advocacy, case management, problem-solving, and referral functions with individuals, groups, families, organizations, and the community.

Honors B.S.W. Program

Criteria for Admission. For information about admission to the Barrett Honors College, call 480/965-2359. The Barrett Honors College reviews applications on November 1, December 1, and the 15th of every other month. Minimum GPA eligibility ranges from 3.25 to 3.40, depending on the number of semester hours.

Students must be admitted to the B.S.W. program and have a 3.50 GPA in all social work courses they may have taken before admission to the program. To retain honors status, students must maintain a 3.25 GPA in their honors social work classes. However, to graduate from the Barrett Honors College, students must have an overall ASU GPA of 3.40.

Honors College Requirements. Students must comply with the Barrett Honors College requirements and take one of the following options:

1. HON 171 and 172 The Human Event (not available to transfer students);
2. HON 371 Freedom and Authority;
3. HON 374 Black and White Atlantic; or
4. HON 394 Special Topics.

In addition, students must take SWU 493 Honors Thesis for three to six semester hours. The thesis can be a social work research or creative project preferably related to the student’s field placement or area of interest. Students must have a faculty mentor/chair to assist with the thesis or creative project.

Typical Program of Study

Junior Year

B.S.W. Requirement

SWG 502 Human Behavior in the Social Environment II.....	3
Total	3

Senior Year

Fall Semester

HON 371 Freedom and Authority	3
or HON 374 Black and White Atlantic (3) or HON 394 Special Topics (3) ¹	
SWG 510 Foundation Practice I.....	3
SWG 531 Social Policy and Services I.....	3
SWU 412 Field Instruction I.....	5
SWU 413 Field Instruction Seminar I.....	1
Total	15

Spring Semester

SWG 511 Foundation Practice II.....	3
SWG 580 Community and Organizational Change.....	3
SWU 414 Field Instruction II	3
SWU 415 Integrative Field Seminar.....	3
SWU 493 Honors Thesis ²	3-6
Total	15-18

¹ If students have already taken HON 171 and 172, HON 394 is not taken.

² Students may want to take three semester hours of thesis in each of the fall and spring semesters.

Note: The preceding graduate (SWG) courses are taken in lieu of the following undergraduate courses: SWU 340 Human Behavior in the Social Environment II, SWU 410

Social Work Practice II, SWU 411 Social Work Practice III, SWU 432 Social Policy and Services, and SWU 442 Introduction to Practice with Children and Families in Child Welfare or SWU 444 Issues in School Social Work.

Optional. Students who have not already taken SWG 320 and 374 when they are admitted may also take the following equivalent graduate courses:

SWG 519 Research Methods in Social Work	3
SWG 533 Diversity and Oppression in a Social Work Context.....	3

Advanced Standing in M.S.W. Program for Honors

B.S.W. Graduates. Students who complete the Honors B.S.W. program are eligible to apply for advanced standing status in the M.S.W. program. If accepted, they could complete the M.S.W. degree in one calendar year (starting in June only). To be eligible for advanced standing status, the student must have graduated from the honors B.S.W. program within the last five years.

GRADUATE PROGRAM

The faculty in the School of Social Work offer a Master of Social Work degree and a Ph.D. degree in Social Work. For more information, see the *Graduate Catalog*.

UNIVERSITY GRADUATION REQUIREMENTS

In addition to fulfilling college and major requirements, students must meet all university graduation requirements. For more information, see “University Graduation Requirements,” page 74.

General Studies Requirement

All students enrolled in a baccalaureate degree program must satisfy a university requirement for a minimum of 35 semester hours of approved course work in General Studies. See “General Studies,” page 78.

Note that all three General Studies awareness areas are required. Consult your academic advisor for an approved list of courses.

SCHOOL OF SOCIAL WORK DEGREE REQUIREMENTS

All students enrolled in a baccalaureate degree program must satisfy School of Social Work degree requirements with additional course work chosen from among those courses that satisfy the General Studies requirement. General Studies courses are listed in the “General Studies” section, page 78, in the course descriptions, in the *Schedule of Classes*, and in the *Summer Sessions Bulletin*.

A well-planned program of study may enable students to complete many General Studies and School of Social Work degree requirements concurrently. Students are encouraged to consult with an academic advisor in planning a program to ensure that they comply with all necessary requirements. All students are required to demonstrate proficiency in a language other than English (a spoken language or American Sign Language). Proficiency is defined as completing the second semester, intermediate level or higher, of a language other than English.

Specific courses from the following areas must be taken to fulfill the college degree requirements.

Numeracy. School of Social Work students must complete a statistical analysis course (CS).

Humanities and Fine Arts. School of Social Work students must complete PHI 101 Introduction to Philosophy, PHI 105 Introduction to Ethics, or PHI 306 Applied Ethics.

Social and Behavioral Sciences. The following courses are required:

ECN 111 Macroeconomic Principles <i>SB</i>	3
PGS 101 Introduction to Psychology <i>SB</i>	3
or SOC 101 Introductory Sociology <i>SB</i> (3)	
or SOC 301 Principles of Sociology <i>SB</i> (3)	
Total	6

Natural Sciences. School of Social Work students must complete a course in either human biology or anatomy and physiology.

MAJOR REQUIREMENTS

The School of Social Work awards a Bachelor of Social Work degree upon the successful completion of a curriculum consisting of a minimum of 120 semester hours. This curriculum includes all university requirements (see “University Graduation Requirements,” page 74), including the General Studies requirements (see “General Studies,” page 78), as well as the School of Social Work degree requirements.

Course Load. A normal course load per semester is 15 to 16 semester hours. The maximum number of hours for which a student can register is 18 semester hours, unless an overload petition has been filed with and approved by the B.S.W. program coordinator and the College of Public Programs dean’s office.

Overload petitions are not ordinarily granted to students who have a cumulative GPA of less than 3.00 and who do not state valid reasons for the need to register for the credits. Students who register for semester hours in excess of 18 and do not have an approved overload petition on file have courses randomly removed through an “administrative drop” action.

Social Work Core Requirement

SWU 271 Introduction to Social Work <i>SB, H</i>	3
SWU 291 Social Service Delivery Systems	3
SWU 295 Foundations of Social Work Practice	3
SWU 301 Human Behavior in the Social Environment I <i>L/SB</i>	3
SWU 310 Social Work Practice I.....	3
SWU 320 Research Methods in Social Work	3
SWU 340 Human Behavior in the Social Environment II <i>SB</i>	3
SWU 374 Diversity and Oppression in a Social Work Context <i>C</i>	3
SWU 410 Social Work Practice II	3
SWU 411 Social Work Practice III	3
SWU 412 Field Instruction I.....	5
SWU 413 Field Instruction Seminar I	1
SWU 414 Field Instruction II	3
SWU 415 Integrative Field Seminar	3
SWU 432 Social Policy and Services	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

SWU 442 Introduction to Practice with Children and Families in Child Welfare	3
or SWU 444 Issues in School Social Work (3)	
Total	48

SWU 412 and 414 each require 16 hours weekly per semester in the field. Students must file an application for field work before registering for the courses. Students must have senior status to participate in the field.

No credit is granted toward fulfilling major core requirements in any course in the student's major unless the grade in that course is at least a "C." If a grade of "D" or "E" is earned in a major core course, the student must see the faculty advisor to discuss continuance in the major. Most courses in the program are sequential; successful completion of each course in the sequence is required to enroll in the following course.

Field Instruction. Field instruction for the B.S.W. program is offered concurrently with classroom study. Students are assigned to a social service agency and work under the supervision of a School of Social Work-approved social work professional. Field instruction permits testing theory in practice and provides a base of experience for class discussions. Qualified agencies in several Arizona communities are utilized for field instruction.

B.S.W. students work in one placement for 16 hours a week, for a total of 480 hours over two semesters. In assigning the placement, the school takes into account the student's educational needs and career goals. Generalist social workers need to be familiar with the methods of working with individuals, families, and groups, as well as in organizations and communities and with all ages and ethnic groups. The faculty are committed to establishing the capabilities necessary for high-quality, social work generalist practice.

B.S.W. field instruction agencies are located primarily in the Phoenix metropolitan area. Specially arranged, more distant placements may require up to a two-hour drive. Although car pools are possible, personal transportation is strongly recommended while attending school.

ELECTIVES

Each student is encouraged to consult with an academic advisor in selecting electives. Economics, education, psychology, and sociology are only a few of the academic units offering knowledge of value to the professional social work practitioner.

Undergraduate Student Enrollment in Graduate Classes. Seniors within 12 semester hours of graduation may enroll in a maximum of nine graduate semester hours in the School of Social Work, providing they have an overall GPA of 3.00 or higher at the time of enrollment and have secured the required signatures for approval. Courses may be eligible for use in a future graduate program on the same basis as work taken by a nondegree graduate student (see the *Graduate Catalog*).

ACADEMIC STANDARDS

Good Standing. To remain in good academic standing, a student must maintain a minimum overall GPA of 2.00 or higher at the end of each semester in all courses taken at ASU.

Probationary Status. Any student who does not maintain good standing status is placed on probation. Students are placed on probation automatically when the GPA is less than the minimum 2.00 at the end of any semester.

Disqualification. Any student who is on probation becomes disqualified if (1) the student has not returned to good standing or (2) the student has not met the required semester GPA.

See "Academic Standards and Retention," page 469, for more details on academic standards.

Termination from the Social Work Major. A student is terminated from the major under any one of the following circumstances:

1. A B.S.W. student receives an "E" grade (failure) in field practicum.
2. A B.S.W. student does not accept or is not accepted by three or more field agencies if, in the judgment of faculty and field staff, the placements can provide appropriate field experiences without undue inconvenience to the student.
3. The student does not adhere to professional expectations and standards (see the ASU Student Code of Conduct, National Association of Social Workers Code of Ethics, and CSWE Curriculum Policy Statement).
4. A student appears to lack the degree of mental health necessary to function successfully as a social worker. Such a student may be required to undergo a medical examination and make the results available to the Committee on Academic and Professional Standards of the School of Social Work. The responsibility for reviewing and determining the qualification of students whose behavior or performance are in question is vested in the committee. The committee's decision may require the termination of a student from the major.

Continuous Evaluation. While students are subject to the university's general retention policy, they are evaluated in the school on broader criteria than mere GPA. Students are reviewed for evidence of competency in social work and are continuously evaluated as they progress in the program. Prospective Social Work candidates who do not meet the established criteria are guided toward a program that is compatible with their interests and abilities.

Reinstatement. A disqualified student who desires to be reinstated may submit an application for reinstatement. A disqualified student normally is not reinstated until at least one semester has elapsed from the date of disqualification. The burden of establishing fitness is on the disqualified student, who may be required to take aptitude tests and submit to other examinations before being readmitted.

APPEAL PROCEDURES

Appeals involving the professional standards of the discipline are decided by the School of Social Work. Appeals involving grades for course work may be submitted to the College of Public Programs Academic and Student Affairs Committee.

STUDENT RESPONSIBILITIES

Students are expected to support and maintain the highest professional standards as spelled out in the *ASU Student Code of Conduct* and the *National Association of Social Workers Code of Ethics*.

Regular attendance is expected in all classes and in field education and is a critical factor in evaluation of performance.

Students' rights are protected through appeal to the Committee on Academic and Professional Standards or through consultation with the school's ombudsperson.

SPECIAL PROGRAMS

Tucson Component. The School of Social Work offers a B.S.W. program in Tucson in conjunction with the College of Extended Education.

For more information about the B.S.W. program, call the Tucson Component at 520/884-5507.

SOCIAL WORK (SWG)

See the *Graduate Catalog* for the SWG courses.

SOCIAL WORK (SWU)

SWU 271 Introduction to Social Work. (3)

fall and spring

Descriptive and analytical historical perspective of the profession of social work, social problems, and the social welfare system. Designed for freshmen and sophomores considering this major. Prerequisite: PGS 101 or SOC 101.

General Studies: SB, H

SWU 291 Social Service Delivery Systems. (3)

fall and spring

Knowledge and skills necessary to utilize community resources to be a competent case manager. Includes 40 hours of observational experience in local agencies. Pre- or corequisite: SWU 271.

SWU 295 Foundations of Social Work Practice. (3)

fall and spring

Provides theoretical foundation and skill base necessary for social work interventions with individuals, small groups, and larger systems. Pre- or corequisites: SWU 271, 291.

SWU 301 Human Behavior in the Social Environment I. (3)

fall and spring

Analyzes theories of personality and life span development from methodological, ecological, and systems perspectives up to adolescence. Prerequisite: PGS 101 or SOC 101. Pre- or corequisites: SWU 271, 291, 295.

General Studies: L/SB

SWU 302 Human Biology for Social Workers. (3)

fall and spring

Overview of human anatomy and physiology, and the reciprocal relationship between physical and social environments. Lecture, discussion. Pre- or corequisites: SWU 271, 291.

SWU 310 Social Work Practice I. (3)

fall and spring

Introduction to social work methods, emphasizing the following skills: cross-cultural interviewing, assessment, referrals, and process and psychological recording. Prerequisite: SWU 295. Pre- or corequisite: SWU 301.

SWU 320 Research Methods in Social Work. (3)

fall and spring

Applies scientific principles to field practice, impact assessment, intervention procedures, and problem formulation in social work. Lecture, cooperative learning. Pre- or corequisite: SWU 310.

SWU 321 Statistics for Social Workers. (3)

fall and spring

Teaches social work students how to use and interpret descriptive and inferential statistics in social work practice. Lecture, small group work. Prerequisites: MAT 114, 117. Pre- or corequisite: SWU 320.

General Studies: CS

SWU 340 Human Behavior in the Social Environment II. (3)

fall and spring

Life span development from middle childhood to maturity. Lecture, discussion. Prerequisite: SWU 301. Pre- or corequisites: SWU 302, 310.

General Studies: SB

SWU 374 Diversity and Oppression in a Social Work Context. (3)

fall and spring

Issues of social inequality related to race, ethnicity, gender, sexual orientation, and disability. Emphasis on populations of the Southwest. Prerequisite: SWU 310.

General Studies: C

SWU 410 Social Work Practice II. (3)

fall and spring

Knowledge and skills in social work practice with individuals and families. Prerequisites: PHI 101 (or 105 or 306); SWU 310; Social Work major. Corequisites: SWU 412, 413.

SWU 411 Social Work Practice III. (3)

fall and spring

Knowledge and skills in social work practice with groups, communities, and organizations. Prerequisites: SWU 410, 412, 413; Social Work major. Corequisites: SWU 414, 415.

SWU 412 Field Instruction I. (5)

fall and spring

16 hours a week of supervised practice in an approved placement. Prerequisite: Social Work major. Corequisites: SWU 410, 413.

SWU 413 Field Instruction Seminar I. (1)

fall and spring

Field-focused seminar, including practice evaluation. 1.5 hours per week. Prerequisite: Social Work major. Corequisites: SWU 410, 412.

SWU 414 Field Instruction II. (3)

fall and spring

16 hours a week of supervised practice in an approved placement. Prerequisites: SWU 413; Social Work major. Corequisites: SWU 411, 415.

SWU 415 Integrative Field Seminar. (3)

fall and spring

Field-focused seminar to help students integrate practice and theory. Prerequisite: Social Work major. Corequisites: SWU 411, 414.

SWU 432 Social Policy and Services. (3)

fall and spring

Contemporary social, political, and economic issues. Special emphasis on poverty and inequality in the Southwest. Analysis and development of social welfare policies and programs. Prerequisite: ECN 111. Corequisites: SWU 410, 412, 413.

SWU 442 Introduction to Practice with Children and Families in Child Welfare. (3)

fall and spring

Focuses on the characteristics, strengths, and service needs of families and children in the Child Welfare System. Lecture, cooperative learning. Prerequisites: SWU 410, 412, 413; Social Work major.

SWU 444 Issues in School Social Work. (3)

fall and spring

Demonstrates how community, family, and school are interdependent using an ecological metaphor, and introduces school social work. Lecture, cooperative learning. Prerequisites: SWU 410, 412, 413; Social Work major.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Graduate College

Bianca L. Bernstein, Ph.D., Dean

www.asu.edu/graduate



Law Professor Dale Furnish addresses a class. Tim Trumble photo

PURPOSE

Through the faculty, Arizona State University's Graduate College offers programs to meet the educational needs of those who already hold baccalaureate and master's degrees. While many students prepare for careers in research, the professions, and the arts, others study for personal enrichment. Both part-time and full-time students are enrolled in 91 master's and 48 doctoral majors encompassing hundreds of concentrations and specialties. Other students explore new areas of interest or prepare for career advancements apart from formal degree programs.

The size, strength, and diversity of the graduate community reflect the university's commitment to high-quality education. As a major center for graduate education, ASU supports cultural and intellectual activity as well as research in a broad range of arts and sciences and professional disciplines; in addition, the university conducts research addressing the social, cultural, and economic growth and development of Arizona and the Southwest.

One distinctive project that magnifies the Graduate College's dedication to graduate students is the Preparing Future Faculty program, funded by the Pew Charitable Trusts and ASU. The program is designed to educate students about faculty roles and prepare doctoral students specifically for faculty positions in colleges and universities across the nation.

This past year, about 2,000 ASU graduate students were awarded prestigious fellowships and scholarships, exceeding \$3.5 million. These awards were funded by the National Science Foundation, NASA, the Ford Foundation, Fulbright, and other public agencies and private foundations.

ASU assisted more than 2,800 outstanding graduate students through academic and tuition scholarship and other financial support programs. The total financial support amounted to \$15.5 million, exemplifying the university's commitment to enabling student success.

Funded programs, together with more than 30 research centers and institutes, provide assistantships and training for many graduate students; further, the centers coordinate conferences, colloquia, and special seminars to heighten the learning experience. The Office of the Vice Provost for Research provides seed money to enable ASU faculty and students to work at the frontiers of knowledge. Such activities continually encourage the creative embrace of change and experimentation.

ASU provides numerous choices in student life, for personal enrichment as well as cultural interaction. Many internationally known speakers present lectures here, bringing together faculty, graduate students, and the community to engage in stimulating dialogue.

Intellectual Environment. More than 10,000 students from all 50 states and more than 100 nations are enrolled in graduate study at the university. Such size and diversity contrib-

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ute to a cosmopolitan setting that is ideal for intellectual discourse and stimulation. As a balance to this large grouping of students, individual graduate programs conduct small colloquia and seminars where students and faculty discuss their work in an intimate, intellectual environment supportive of student development. The result is a spirited, lively atmosphere in which students and faculty members get to know each other through collaborative research and intellectual exchange.

GRADUATE PROGRAMS

Degree Programs

Although graduate degree programs differ in many ways, they all share two important characteristics. First, in comparison to baccalaureate programs, they demand a deeper and broader understanding of a body of knowledge in a recognized discipline or profession. Second, in master's and especially in doctoral programs, graduate students prepare to make original contributions to their fields through research and other creative activities of a high order. In contrast, then, to the broad-based baccalaureate degree, graduate degrees are specialized. ASU offers several types and levels of postbaccalaureate degrees.

For admission information and procedures, access the Web site at www.asu.edu/graduate/admission, or refer to the *Application for Graduate Admission* booklet.

Master's and Doctoral Work. Many students pursue a master's degree to satisfy their own quest for learning. In some disciplines, such as dance or architecture, the master's degree is normally the terminal or final degree. In other fields, students enter master's programs as the first step toward more advanced work, such as doctoral studies, which prepare students for a lifetime of intellectual inquiry and creativity or for the application of knowledge to professional practice.

Research Degrees. Students at ASU may pursue research-oriented or practice-oriented degrees. Research-oriented degree programs—the Master of Arts (M.A.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.)—prepare students for careers of research and scholarship in governmental, business, and industrial organizations, or in university or college teaching. Students in these programs develop abilities to evaluate existing knowledge critically and extend it into fresh areas of inquiry and scholarship.

Professional Degrees. The professional or practice-oriented degree programs have slightly different names and distinct academic missions. The names of the degrees are commonly tied to the academic unit offering the program, for example, Master of Business Administration (M.B.A.), Master of Music (M.M.), Master of Social Work (M.S.W.), and Doctor of Public Administration (D.P.A.). With the objective of preparing students for professional practice, such programs require rigorous preparation in the fundamental literature and scholarship of the field. Some degrees require demonstrated expertise through an internship, an exhibition (art), a performance (dance), or a recital (music). Examples of ASU fields in which academic units offer professional programs include architecture and design, business, education, engineering, health services administration, law, nursing, public administration, and social work.

Nondegree Graduate Study

Many serious students enter graduate studies without intending to obtain a new degree but rather to enhance personal knowledge. They may want to advance in their present career, acquire the background to make a career change, or make up academic deficiencies before entering a degree program. All graduate students, degree or nondegree, enjoy the benefits of cultural and intellectual activities at the university, such as colloquia, seminars, and conferences focusing on the latest scholarship in the field. By consulting with appropriate academic units, students can learn which courses are suitable to their needs.

For admission information and procedures, access the Web site at www.asu.edu/graduate/admission, or refer to the *Application for Graduate Admission* booklet.

Student Services for Nondegree Students. The Graduate College maintains an advising office open year-round. See "Graduate Student Support Services," page 502, for more information.

Graduate Studies and University Environment

The Graduate College spans the university in supervising graduate studies and offering all postbaccalaureate degrees except the Juris Doctor, which is administered by the College of Law. Since more than 1,600 ASU faculty members teach graduate students in more than 115 instructional units, the Graduate College works closely with the other colleges and academic units. In most cases, graduate instruction is offered by units that also provide related undergraduate programs.

Interdisciplinary Study. Although most graduate programs are offered by academic units, diverse interdisciplinary programs cross academic disciplines and come under the supervision of the Graduate College. Many majors are in fields that are still emerging as recognized academic disciplines and, therefore, do not customarily form the academic basis for departments. Other fields of study are inherently interdisciplinary and do not fit well with conventional disciplines around which departments are formed. Curricula must reflect intrinsically broad disciplinary affinities, and faculty must be drawn from more than one academic unit.

Currently, the Graduate College oversees nine interdisciplinary programs; several others are planned. Existing programs include the Gerontology Program (Certificate in Gerontology jointly offered by ASU Main and ASU West), Creative Writing (M.F.A.), Curriculum and Instruction (Ph.D.) (jointly administered with the College of Education), Exercise Science (Ph.D.), Justice Studies (Ph.D.), Science and Engineering of Materials (Ph.D.), Speech and Hearing Science (Ph.D.), Statistics (M.S.), and Transportation Systems (Certificate in Transportation Systems).

Other interdisciplinary degree programs include Communication (Ph.D.) (administered by the College of Public Programs), History and Theory of Art (Ph.D.) (jointly offered with the University of Arizona; administered by the School of Art), Humanities (M.A.) (administered by the College of Liberal Arts and Sciences), and Molecular and Cellular Biology (M.S., Ph.D.) (administered by the College of Liberal Arts and Sciences).

Each of these programs utilizes resources and faculty from several disciplines. They promote cooperative research

Interdisciplinary Graduate Degrees and Majors Overseen by the Graduate College

Major	Degree	Concentration	Administered By
Creative Writing	M.F.A.	—	Creative Writing Committee
Curriculum and Instruction	Ph.D.	Art education, curriculum studies, early childhood education, educational media and computers,* elementary education, English education, exercise and wellness education, language and literacy, mathematics education, music education, physical education, science education, special education	Interdisciplinary Committee on Curriculum and Instruction
Exercise Science	Ph.D.	Biomechanics, motor behavior/sport psychology, physiology of exercise	Committee on Exercise Science
Justice Studies	Ph.D.	Criminal and juvenile justice; dispute resolution; law, justice and minority populations; law, policy, and evaluation; women, law, and justice	Committee on Law and Social Sciences
Materials Science	M.S.	—	Committee on the Science and Engineering of Materials
Science and Engineering of Materials	Ph.D.	High-resolution nanostructure analysis, solid-state device materials design	Committee on the Science and Engineering of Materials
Speech and Hearing Science	Ph.D.	Developmental neurolinguistic disorders, neuroauditory processes, neurogerontologic communication disorders	Committee on Speech and Hearing Science
Statistics	M.S.	—	Committee on Statistics

* Applications are not being accepted at this time.

and instruction among faculty who share common interests but are housed in different academic units. They allow students to pursue degrees that are intellectually coherent but that bring together diverse strengths of the university. See the “Interdisciplinary Graduate Degrees and Majors Overseen by the Graduate College” table on this page.

Creative Writing—M.F.A.

The interdisciplinary Master of Fine Arts degree in Creative Writing (options include fiction, nonfiction, playwriting, poetry, and screenwriting) is administered by the Creative Writing Committee. This studio/academic program involves the research, creative activity, and teaching interests of faculty within the Departments of English and Theatre. This program provides students with the opportunity to tailor a course of study to fit individual needs, talents, and goals. Students work under the direction of faculty who are practicing, published writers. For more information, see the *Graduate Catalog*.

Curriculum and Instruction—Ph.D.

The interdisciplinary Ph.D. degree in Curriculum and Instruction is administered by the Interdisciplinary Committee on Curriculum and Instruction and overseen jointly by the Graduate College and the College of Education. Areas of concentration are available in art education, curriculum studies, early childhood education, educational media and computers, elementary education, English education, exercise and wellness education, language and literacy, mathematics education, music education, physical education, science education, and special education. For more information, see the *Graduate Catalog*.

Exercise Science—Ph.D.

The interdisciplinary Ph.D. degree in Exercise Science is administered by the Committee on Exercise Science. This individualized interdisciplinary degree integrates graduate courses from a variety of academic units to provide a sound foundation for research leading to a dissertation with concentrations in biomechanics, motor behavior/sport psychology, or physiology of exercise. For more information, see the *Graduate Catalog*.

Gerontology

An interdisciplinary, 24-semester-hour Certificate in Gerontology, administered by the Committee on Gerontology, may be earned by graduate students who wish to study the biological, psychological, sociological, and policy-related aspects of aging as well as the economic, health, and social concerns of older people. Students enrolled in the certificate program may simultaneously pursue a major in an academic unit offering a graduate degree or may enter the program as nondegree graduate students. The Certificate in Gerontology provides a broad academic foundation for students who wish to apply the knowledge and skills acquired in their major to a variety of aging-related pursuits. For more information, see the *Graduate Catalog*.

For information on the undergraduate minor in Gerontology, see “Gerontology,” page 102.

GERONTOLOGY (GRN)**ASU Main****GRN 430 Multidisciplinary Approaches to Gerontology. (3)***once a year*

Examines literature that each discipline brings to the study of gerontology. Covers both theory and practice. Lecture, discussion.

*General Studies: SB***GRN 431 Caregiving. (3)***once a year*

Examines theory and practice of caregiving for the senior population. Lecture, discussion.

GRN 440 Aging and Wellness. (3)*fall and spring*

One-on-one service/experiential learning with seniors from the community. May be repeated for credit. Lecture, lab.

GRN 450 Biology of Aging. (3)*spring*

Examines normal biological aging and changes in the functional capabilities in the elderly. Lecture, lab.

GRN 460 Alzheimer's and Related Dementias. (3)*fall and spring*

Familiarizes students with Alzheimer's disease and related dementias from a caregiver's perspective. Lecture, lab.

GRN 484 Undergraduate Internship. (3–6)*fall, spring, summer***GRN 494 ST: Undergraduate Special Topics. (3)***fall and spring***GRN 498 PS: Undergraduate Pro-Seminar. (3)***spring***GRN 499 Undergraduate Individualized Instruction. (3)***fall, spring, summer***GRN 530 Multidisciplinary Approaches to Gerontology. (3)***once a year*

Examines literature that each discipline brings to the study of gerontology. Covers both theory and practice. Lecture, discussion.

GRN 531 Caregiving. (3)*once a year*

Examines theory and practice of caregiving for the senior population. Lecture, discussion.

GRN 540 Aging and Wellness. (3)*fall and spring*

One-on-one service/experiential learning with seniors from the community. Lecture, lab. Cross-listed as SWG 517. Credit is allowed for only GRN 540 or SWG 517.

GRN 550 Biology of Aging. (3)*spring*

Examines normal biological aging and changes in the functional capabilities in the elderly. Lecture, lab.

GRN 560 Alzheimer's and Related Dementias. (3)*fall and spring*

Familiarizes students with Alzheimer's disease and related dementias from a caregiver's perspective. Lecture, lab.

GRN 584 Graduate Internship. (3–6)*fall, spring, summer***GRN 590 Graduate Reading and Conference. (3)***fall, spring, summer***GRN 591 Graduate Seminar. (1–6)***fall and spring***Justice Studies—Ph.D.**

The interdisciplinary Doctor of Philosophy degree program with a major in Justice Studies is administered by the Committee on Law and Social Sciences. The degree program integrates historical, legal, and philosophical approaches with social science training. Areas of concentration include criminal and juvenile justice; dispute resolution; law, justice, and minority populations; law, policy, and evaluation; and women, law, and justice. For more information, see the *Graduate Catalog*.

Science and Engineering of Materials—Ph.D.

The interdisciplinary Ph.D. degree in Science and Engineering of Materials is administered by the Committee on Science and Engineering of Materials. Areas of concentration are available in solid-state device materials design and high-resolution nanostructure analysis. Emphasis is placed on the applications of chemical thermodynamics, the mechanics of solids, quantum mechanics and transport theory for investigation of the relationships between microstructure and properties of solids, and the dependence of microstructures on processing. For more information, see the *Graduate Catalog*.

SCIENCE AND ENGINEERING OF MATERIALS (SEM)

See the *Graduate Catalog* for the SEM courses.

Speech and Hearing Science—Ph.D.

The interdisciplinary Doctor of Philosophy degree program with a major in Speech and Hearing Science is administered by the Committee on Speech and Hearing Science. Areas of concentration are available in developmental neurolinguistic disorders, neuroauditory processes, and neurogerontologic communication disorders. The purpose of the program is to prepare scholars for careers of basic and applied research in academia or in health care delivery environments. The unifying theme of the program is the influence aging and changes in the neurologic condition have upon human communication and communication disorders. For more information, see the *Graduate Catalog*.

Statistics—M.S.

The interdisciplinary M.S. degree in Statistics is administered by the Committee on Statistics. The program involves faculty and resources from the School of Accountancy and Information Management and the Department of Mathematics. Areas of emphasis include applied statistics, mathematical statistics, statistical computing, statistical modeling, and statistical sampling and survey research. For more information, see the *Graduate Catalog*.

Certificate Programs

A number of certificate programs are offered by various academic units or programs on campus (see the "ASU Post-baccalaureate Certificates" table, page 106).

Transportation Systems

The interdisciplinary Certificate in Transportation Systems program is administered by the Committee on Transportation Systems. The objective of this program is to enable existing ASU graduate students and transportation professionals with advanced degrees to examine transportation-related issues from a variety of perspectives and in the context of different travel modes. For more information, see the *Graduate Catalog*.

TRANSPORTATION SYSTEMS CERTIFICATE (TRC)

See the *Graduate Catalog* for the TRC courses.

Research Programs

ASU continues to advance as a major research institution. The Office of the Vice Provost for Research provides leadership in obtaining external funding and in coordinating and administering sponsored projects. Many graduate students receive financial support and gain first-hand experience as

they participate with faculty members in carrying out these research projects.

Much of this work is associated with campus research centers that help to develop proposals, coordinate activities, and bring together in colloquia and conferences students and faculty with common intellectual interests. Such centers include the Center for Solid-State Science, the Manufacturing Institute, the Institute of Human Origins, the Hispanic Research Center, and the Preventive Intervention Research Center. For further information on centers and institutes, see "Research Centers, Institutes, and Laboratories," page 27.

Research Facilities

The university lends support to research in diverse ways, including extensive facilities for research and instructional programs. State-of-the-art facilities include an architecture building, a fine arts complex, the Goldwater Center for Science and Engineering, an addition to the Life Sciences Center, and the Computing Commons. The Engineering Research Center, built as part of the Engineering Excellence Program, houses advanced facilities such as the molecular beam epitaxy laboratory and a clean room for microelectronic device fabrication. Other facilities supporting research on campus are the Institute for Studies in the Arts, in the Herberger College of Fine Arts; the Facility for High Resolution Electron Microscopy, in the College of Liberal

Arts and Sciences; and the Southwest Archaeological Collection, in the Department of Anthropology.

Graduate Student Support Services

Providing academic and professional development support to graduate students is an important part of the Graduate College mission. Services include advising, individual mentoring for disadvantaged students, financial assistance, orientation sessions, workshops, career seminars, and research conferences.

Graduate College Student Programs/Services maintains a variety of programs specifically for graduate and nondegree students.

Graduate College Financial Assistance Office. The Graduate College Financial Assistance Office meets the needs of graduate and professional students. Students may receive financial services at Wilson Hall, without having to visit other offices on campus. Students may obtain general information about graduate financial assistance at ASU, may turn in documents, or receive status information on their student loans. Students can also apply for emergency short-term loans or pick up forms to report special circumstances. Staff members are available to help students with financial assistance concerns. Refer to "Financial Aid," page 48, for a full description of graduate financial support and services, or visit the Web site at www.asu.edu/graduate.



Old Main after the completed restoration of 2000

Tim Trumble photo

Advising and Career/Professional Development. Many graduate students have questions and concerns about which degree to pursue; how to combine their student roles with parenting, partnering, and worker roles; and what opportunities and possibilities their degrees may provide upon graduation. The Graduate College provides the following resources.

Advising. The Graduate College's Academic Advising Office supplies general information about policies, procedures, requirements, and support services. Appointments are available throughout the year.

Students with regular admission status should contact their academic unit for degree program advisement and program of study planning.

Career/Professional Development Seminars. The Graduate College, in conjunction with Counseling and Consultation, offers seminars to groups of graduate students interested in exploring career-related subject matters. Examples of seminar topics are dual career issues, the impact of values on career decision making, and transferable skills.

Career Planning Services for Graduate Students. In conjunction with Career Services and Counseling and Consultation, the Graduate College provides a brochure listing numerous career planning services for graduate student needs. This publication is also available at www.asu.edu/career.

Diversity Programs. The Graduate College's Diversity Programs are designed to increase the number of graduate students from groups underrepresented in certain fields of study. Students interested in these programs must first go to their respective departments for nomination.

Diversity Assistantship Program (DAP). The purpose of this merit-based program is to support research and creative activities related to a student's field of study. Nominations are made by departments, and recipients are supervised by a faculty member.

Academic Support Program (ASP). The purpose of ASP is two-fold: financial assistance and peer mentoring. ASP is available primarily to first-year students; however, departments are asked to provide a student's subsequent funding. The program is based on financial need and the nominations of students by departments. Financial support is provided in the form of federal work-study to support field-related research that is supervised by a faculty member. For additional academic support, a student meets weekly with an assigned peer mentor who is two or more years advanced in the academic program.

The Social and Academic Mentor Program. The Graduate College Social and Academic Mentor (SAM) program is designed to recruit top graduate students from domestic, international, and underrepresented populations. Academic units submit applications to the Graduate College to nominate a first-year student (mentee) and peer mentor match. The mentor, two or more years advanced in the program, promotes the mentee's social and academic integration into graduate school by using a structured format. The mentor meets weekly with the mentee and schedules regular monthly meetings with the faculty advisor to discuss the mentee's concerns, progress, accomplishments, or department-related matters.

Orientations. Each semester, the Graduate College hosts orientations for new graduate students and teaching assistants (TAs).

In addition to the General (new student) Orientation, teaching assistants have the opportunity to enrich and enhance their teaching through seminars offered each semester. At least two seminars are mandatory for first-time TAs. Among other topics, TAs can attend sessions on teaching lab sciences, human diversity, critical thinking, classroom management, ethical issues, and multimedia applications in the classroom.

Workshops for Undergraduate Students Considering Graduate Education. The Graduate College holds workshops to address the issues that students contemplating graduate study should consider. The purpose of graduate study, the choices among research and professional degrees, the selection of schools to apply to, and the types and sources of financial support are among the topics discussed.

Student Organizations. The Graduate Student Council is part of the Associated Students of Arizona State University (ASASU), the student government for the university. The Graduate Research Support Office represents graduate student interests within ASASU and the Office of Student Life. It assists the Graduate College in planning orientations and other student-related activities and funds with the Graduate College small research grants to support graduate students' thesis and dissertation projects. In addition to the council, many other special interest organizations are open to graduate students.

Format Office. The thesis, dissertation, or equivalent is the culmination of an important stage of graduate studies. By researching and writing this final work, graduate students are able to demonstrate acquired skills essential to a discipline. The Graduate College publishes a *Format Manual* as a guide in preparing the master's or doctoral document. Both the *Format Manual* and forms pertaining to procedures for completing all graduation requirements are available in the Graduate College lobby in Wilson Hall or on the Web at www.asu.edu/graduate/formatmanual.

Publications Program. The Graduate College publishes a number of brochures, fliers, and other items pertaining to academic program offerings, procedures, student financial assistance, and related topics and events in graduate education. For more information, please call the Publications Unit at 480/965-3521.

Graduate Council

The Graduate Council establishes general policies for graduate programs and serves as an advisory board to the dean. As part of its duties, the council reviews proposals for new degree programs and concentrations, regularly conducts reviews of established academic programs, and sets policies and general standards for graduate admissions. Sixteen faculty and one student serve on the council, representing a wide variety of degree programs, with at least one member representing each college in the university. An Academic Senate representative is also elected to serve. Council members are appointed by the president of the university.

Offices of the Graduate College

The general offices of the college, including those of the dean, admissions, advising, financial assistance, and operations are located on the first floor of Wilson Hall in the center of campus. Graduate College offices are open from 8 A.M. to 6 P.M., Monday through Thursday; and 8 A.M. to 5 P.M., on Friday. For more information, call 480/965-3521, send e-mail to gradadmiss@asu.edu about admissions or asugrad@asu.edu about other topics, or access the Web site at www.asu.edu/graduate.

ADMISSION TO THE GRADUATE COLLEGE

Eligibility

Anyone who holds a bachelor's (or equivalent) or graduate degree from a college or university of recognized standing is eligible to apply for admission to the Graduate College. Remedies for undergraduate deficiencies may be assigned if the undergraduate degree is based on credits not accepted by ASU, such as life experience or noncredit workshops and seminars.

Graduate College Requirements

Generally, an applicant must have a GPA of 3.00 (scale is 4.00 = A), or the equivalent, in the last two years of work leading to the bachelor's degree. A student who enters a graduate degree program is expected to have undergraduate educational experiences, including general education studies, that are similar to those required for the baccalaureate degree at ASU.

Requirements of the Academic Unit

Academic units, departments, or colleges, may have admission requirements in addition to those of the Graduate College. Many graduate programs require scores from a national admissions test such as the Graduate Record Examination, Graduate Management Admission Test, or the Miller Analogies Test. Some programs require a portfolio, letters of recommendation, or a statement of goals. Applicants should contact the academic unit regarding specific requirements.

Submission of an Application

For admission information and procedures, access the Web site at www.asu.edu/graduate/admission, or refer to the *Application for Graduate Admission* booklet. Students may apply via the Web, by mail, or by fax.

Application Fee

Each application for entry to ASU graduate programs must be accompanied by a nonrefundable application fee. The fee is \$45 to apply for admission to a degree program and \$15 to apply for nondegree studies. For admission information and procedures, access the Web site at www.asu.edu/graduate/admission, or refer to the *Application for Graduate Admission* booklet.

International Applicants

Applicants who will attend the university while holding F-1 or J-1 visas must meet the regulations of the Immigration and Naturalization Service in addition to the requirements of the Graduate College and the academic units to which they apply.

International applicants must meet the requirements of the Graduate College as well as those of the degree programs to which they apply. Applicants from outside the

United States are also required to submit additional materials and should follow the procedures described in the *Application for Graduate Admission* booklet or on the Web at www.asu.edu/graduate/admission. International applicants should read this information carefully to become familiar with all the requirements they must meet, consulting it often for instructions to follow regarding the submission of materials. The *Graduate Catalog* provides essential information about ASU and its graduate programs, but applicants can also consult the ASU listings in *Peterson's Graduate Education Directory* and in the *Directory of Graduate Programs* (published by the Educational Testing Service).

TOEFL Requirement. Among the additional materials required of international students are scores from English language examinations. All applicants whose native language is not English must submit a score from the Test of English as a Foreign Language (TOEFL). The TOEFL can be waived if the undergraduate degree is earned from an English-speaking institution. For a complete list of TOEFL requirements, see page 7 of the *Graduate Admissions* booklet, or access the Web site at www.asu.edu/graduate/admission.

All international applicants who do not speak English as a primary language and who wish to apply for teaching assistantships must pass an examination that certifies their skill in speaking English—either the Test of Spoken English (TSE), which may be taken in the student's home country, or the Speaking Proficiency English Assessment Kit (SPEAK) test, which is administered at ASU. Some degree programs also require TSE or SPEAK scores of applicants whose native language is not English. For specific information about TSE requirements, contact the head of the academic unit.

As required by the U.S. Immigration and Naturalization Service, international applicants must also verify that they have the financial resources to cover their expenses during graduate study at ASU. The Financial Guarantee form is available in the *Application for Graduate Admission* booklet. It can also be accessed through the Graduate College Web site at www.asu.edu/graduate/admission. International applicants must ensure that the guarantee form and a verification from a bank or sponsoring organization is completed and submitted to Graduate Admissions. The I-20 or the IAP66 (documents needed to obtain a student visa) are issued only after the completed, properly verified Financial Guarantee form has arrived. International students may enroll at ASU only if they have been admitted to a degree program, a certificate program, or the postbaccalaureate teacher education program. They must meet all appropriate immigration standards and requirements.

Applications are processed when they are received. However, international applicants should submit all materials in December or January in order to begin study the following fall semester and in August or September in order to begin study the following spring semester. An application fee of \$45 (in U.S. funds) must accompany the formal application. Applications received without the fee are not processed.

All F-1 or J-1 visa students must have insurance coverage against illness and accident before being permitted to register. Insurance must be maintained throughout the student's enrollment in the university and may be obtained at the time of registration.

Upon arrival on campus, students must report to an advisor in the International Student Office.

Additional Information

The Graduate College does not have deadlines. Applications are processed as they are received. However, many academic units have specific and early deadlines; many units review applications once a year, usually in January or February for fall admission. Applicants are urged to contact the academic units regarding deadlines.

Academic units, which must indicate their willingness to admit applicants, frequently set higher standards than those established by the Graduate College. Many qualified applicants are denied because of limits on the number of students admitted each year.

Notice of Admission Decisions

Only the dean of the Graduate College can make formal offers of admission. The Graduate College notifies all applicants in writing of the admission decision.

All academic credentials and supporting materials received by the university in connection with an application for admission become the property of ASU. If the applicant does not enroll in the university within one year, the admission documents may be destroyed.

The date (month/day/year) on the Graduate College dean's letter of admission is the actual date of admission. If the student is enrolled in courses on the admission date, those courses—if applicable—may be considered part of a program of study. Courses taken the semester before this date are considered nondegree hours.

Admission Classifications

Regular Admission. Applicants who fulfill all requirements for admission and are academically acceptable to both the academic unit and the Graduate College are granted regular admission.

Regular Admission with Deficiencies. A student whose grades and test scores are at an acceptable level but who does not have the undergraduate background expected by the academic unit and the university may be required to complete courses to remedy deficiencies. In such cases, the letter of admission specifies the deficiencies that must be completed before the student is awarded a graduate degree. Deficiency courses may not be applied toward the minimum hours required for the degree program.

Provisional Admission. A student who does not meet minimum academic standards but has counterbalancing evidence to suggest the potential for success may be admitted on a provisional basis. Provisional admission provides an academic unit with more evidence on which to base its decision. Normally the academic unit reviews the student's status following completion of 12 semester hours of approved graduate study. At that time, the academic unit recommends to the Graduate College a change in status to either regular admission or withdrawal from the program. When students have completed their provisional requirements, they should check with their advisors to make sure that the change of status has been recommended. A provisional student may also be assigned deficiencies.

Nondegree Admission. A student not interested in earning a degree or not ready to apply to a particular degree program may enroll as a nondegree student. The application process is streamlined and does not require submission of tran-

scripts or test scores. For nondegree admission information and procedures, access the Web site at www.asu.edu/graduate/admission, or refer to the *Application for Graduate Admission* booklet. Students may apply electronically. A maximum of nine hours taken at ASU while in this category may be applied toward a master's degree if appropriate for the student's program of study.

The six-year maximum time limit applies to nondegree semester hours appearing on a master's program of study. In addition, because of limited class size and resources, certain academic units may limit the enrollment of nondegree students.

Recognition of a Degree

Recognition of a degree is acknowledgment that the program leading to the degree is equivalent to a program offered by ASU or is an acceptable program for the proposed graduate major at ASU. A student who enters a graduate degree program at ASU is expected to have undergraduate educational experiences, including general education studies, that are appropriate for the program.

Definition of a Unit of Credit

The Arizona Board of Regents has defined (May 26, 1979) a unit of credit for the institutions under its jurisdiction. A minimum of 45 hours of work by each student is required for each unit of credit. An hour of work is the equivalent of 50 minutes of class time (often called a "contact hour") or 60 minutes of independent study work. For lecture-discussion courses, this requirement equates to at least 15 contact hours and a minimum of 30 hours of work outside of the classroom for each unit of credit. Even though the values of 15 and 30 may vary for different modes of instruction, the minimum total of 45 hours of work for each unit of credit is a constant. Since the unit of credit as defined by the Arizona Board of Regents is the cornerstone of academic degree programs at ASU, degrees granted by other institutions that are recognized by ASU should be based on a similar unit of credit.

GRADUATE COLLEGE PROCEDURES

Change in Graduate Degree Program

A change from one graduate degree program to another requires a new application to the Graduate College. The usual admission procedures are followed. For details on matters relating to the application fee, see "Application Fee," page 504.

Readmission to the Graduate College

Any graduate student who has not been in attendance at the university for one or more semesters must submit an application for readmission to the Graduate College. The application should be submitted at least one month before the beginning of the semester in which the student plans to reenter. For details on readmission and other matters relating to the application fee, refer to the *Application for Graduate Admission* booklet, or access the Web site at www.asu.edu/graduate/admission.

Determination of Catalog Requirements

The *Graduate Catalog* is published annually. Requirements for an academic unit or college, campus, or the university as a whole, may change and are often upgraded.

A student graduates under the curriculum, course requirements, and regulations for graduation in effect at the time of admission to a graduate degree program at ASU. A student may also choose to graduate under any subsequent catalog issued. *In determining graduation requirements, a student may use only one catalog.*

Some changes in policies and procedures affect all students regardless of the catalog used by the student. These policies and procedures may appear in the catalog or in other university publications.

Registration

Graduate students, like all university students, register during the intervals indicated in the *Schedule of Classes* issued by the Office of the Registrar. Details regarding registration and course drop-add procedures are also provided in the *Schedule of Classes*. Day and evening graduate classes, offered on or off campus during the two regular semesters and the summer sessions, are considered part of the regular program.

InTouch, the ASU touch-tone telephone system for registration and fee payment, and the online registration system, accessed at any registrar site, ease the enrollment process.

Audit Enrollment

Graduate students may register as auditors in one or more courses with the approval of the supervisory committee chair and the consent of the instructor involved. The student must be registered properly and pay the fees for the course. An audited course is counted in the student's maximum course load. It does not count for students who must take a minimum number of credits, e.g., teaching assistants or students receiving financial assistance. The mark of "X" is recorded for completion of an audited course, unless the instructor determines that the student's participation or attendance has been inadequate, in which case a "W" may be recorded.

Withdrawal Policies and Procedures

Students who find it necessary to withdraw from the university should obtain and complete an official withdrawal form from any registrar site. Until officially withdrawn, the student is registered in all courses and, at the end of the semester, receives grades appropriate for the performance in each course. A student who officially withdraws from the university during the first four weeks of a semester receives the mark of "W" in all courses registered. A student who officially withdraws from the university later than the fourth week receives a mark of "W" or "E," depending upon the quality of work at the time of official withdrawal. No student is permitted to withdraw during or after the last two weeks of the semester (the last week of classes and final examination week).

Failure to withdraw officially from a course results in a grade of "E," which is used in the computation of the GPA. The *Schedule of Classes* lists the procedures for withdrawal.

An instructor may withdraw a student from a class with a mark of "W" or a grade of "E" for disruptive classroom behavior. A student may appeal an instructor-initiated withdrawal to the standards committee of the college in which the course is offered. The decision of the committee is final.

A graduate student who does not enroll for three calendar years is considered withdrawn and must reapply for admission to a degree program.

Unrestricted Withdrawal. During the first four weeks of a semester or the first six days of a summer session, a student may withdraw from any course with a mark of "W." See the *Schedule of Classes* or the *Summer Sessions Bulletin* for the dates of the unrestricted withdrawal period.

Restricted Withdrawal. From the fifth week to the end of the 10th week of a semester and from the seventh day to the end of the third week of a summer session, students may withdraw with a mark of "W" from courses only in which the instructor certifies that they are passing at the time of the withdrawal. See the *Schedule of Classes* or the *Summer Sessions Bulletin* for dates of the restricted withdrawal period.

Medical Withdrawal. Normally, a medical withdrawal request is made in cases where serious illness or injury prevents a student from completing course work or when other arrangements with the instructor are not possible. Consideration is usually given for complete withdrawal. An application for less than a complete withdrawal must be well documented to justify the selective nature of the medical withdrawal request. This policy applies both to cases involving physical health problems and those involving mental or emotional difficulties.

To receive permission for a medical withdrawal from courses, a student must present a Request for Documented Medical Withdrawal form and proper documentation (usually a letter from a physician) of the medical condition to the medical withdrawal designee of the college of the student's major. For complete procedural information, contact the appropriate medical withdrawal designee.

Course Load

The course load is determined by the supervisory committee but is not to exceed 15 semester hours of credit during each of the two semesters. Refer to the latest *Summer Sessions Bulletin* for course load limits for five-week and eight-week sessions. An audited course is counted in the student's maximum load.

All teaching and research assistants and associates must enroll for a minimum of six semester hours during each semester (fall and spring) of their appointment. The six hours cannot include audit enrollment. Enrollment in continuing registration (595, 695, or 795) does not fulfill the six-hour requirement. A half-time (50 percent) teaching and research assistant or associate working 20 clock hours per week may not register for more than 12 hours of course work each semester; a third-time (33 percent) assistant or associate for more than 13 hours; and a quarter-time (25 percent) assistant or associate for more than 15 hours.

All graduate students doing research, working on theses or dissertations, taking comprehensive or final examinations, or using university facilities or faculty time must be registered for a minimum of one semester hour of credit (not audit) that appears on the program of study or is an appropriate graduate-level course, such as 595, 695, or 795 Continuing Registration.

Doctoral students fulfilling residence requirements for the Doctor of Philosophy and Doctor of Musical Arts degrees must be enrolled full time (nine semester hours minimum or six semester hours for research assistants or teaching assistants) during the specified period. See "Residency Classification Procedures and Policies," page 46, and

Enrollment Verification Guidelines for Graduate Students

	Full Time	Half Time	Less Than Half Time
Regular semester			
Graduate	9 or more hours	5–8 hours	4 or fewer hours
Graduate assistant*	6 or more hours	—	—
Five-week summer session			
Graduate	3 or more hours	2 hours	1 hour
Graduate assistant*	2 or more hours	1 hour	—
Eight-week summer session			
Graduate	5 or more hours	3–4 hours	2 or fewer hours

* For enrollment verification purposes, “graduate assistant” is a generic term that includes graduate assistants, teaching assistants, research assistants, graduate associates, teaching associates, and research associates.

specific degree requirements for fulfilling residence requirements for other doctoral degree programs.

Summer Course Loads. Refer to the latest *Summer Sessions Bulletin* for course load limits for five-week and eight-week sessions.

Enrollment Verification Guidelines. The registrar is responsible for verifying enrollment according to the general guidelines. See the “Enrollment Verification Guidelines for Graduate Students” table, on this page.

GRADUATE COLLEGE DEGREE REQUIREMENTS

Graduate Advising

Advising is much more than technical support; it is an integral part of graduate education. Students’ programs of study are generally tailored to meet individual needs, and students should seek advice from faculty or advisors as they plan their course work, examinations, and other degree requirements.

Grading

The “Grades” table, on this page, defines grades and gives their values.

A grade of “P” (pass) in a 400-level course may not appear on a program of study. Grades on transfer work or ASU law credit are not included in computing GPAs.

Grades of “D” and “E” cannot be used to meet the requirements for a graduate degree, although they are used to compute the GPAs. A student receiving a grade of “D” or “E” must repeat the course in a regularly scheduled (not an independent study) class if it is to be included in the program of study. However, both the “D” or “E” and the new grade are used to compute GPAs.

Graduate course work (500-, 600-, and 700-level courses) reported as an “I” (incomplete) must be completed within one calendar year. At the time the “I” grade is given, the student must complete a “Request for Grade of Incomplete” form. The form first serves as a record of the “I” grade and the work required to complete it. When the student has completed the work, the form then serves as a change-of-grade authorization.

If the work specified on the form is not completed within one calendar year, the “I” grade (500-, 600-, and 700-level courses) becomes part of the student’s permanent transcript. The student is not allowed to complete the course work as specified on the “Incomplete” form. The student may, however, repeat the course after the “I” has become permanent,

by reregistering, paying fees, and fulfilling all course requirements. The grade for the repeated course appears on the transcript but does not replace the permanent “I.”

Repeating ASU Courses. Graduate students (degree or nondegree) may retake any courses at any level at ASU, but all grades remain on the student transcript as well as in GPA calculations.

Grades

Grade	Definition	Value
A	Excellent	4.00
B	Good	3.00
C	Passing	2.00
D	No graduate credit	1.00
E	Failure	0.00
I	Incomplete	—
W	Withdrawal ¹	—
X	Audit	—
Y	Satisfactory	—
Z	Course in progress ²	—

¹ This grade is given whenever a student officially withdraws.

² This grade is usually given pending completion of courses.

University Policy for Student Appeal Procedures on Grades

Informal. The following steps, beginning with step A, must be followed by any student seeking to appeal a grade. Student grade appeals must be processed in the regular semester immediately following the issuance of the grade in dispute (by commencement for fall or spring), regardless of whether the student is enrolled at the university. It is university policy that students filing grievances and those who are witnesses will be protected from retaliation. Students who believe they are victims of retaliation should immediately contact the dean of the college in which the course is offered.

- A. The aggrieved student must first undergo the informal procedure of conferring with the instructor, stating the evidence (if any) and reasons for questioning that the grade received was not given in good faith. The instructor is obliged to review the matter, explain the grading procedure utilized, and show how the grade in question

was determined. If the instructor is a graduate assistant and this interview does not resolve the difficulty, the student may then go to the faculty member in charge of the course (regular faculty member or director of the course sequence) with the problem.

- B. If the grading dispute is not resolved in step A, the student may appeal to the department chair or other appropriate chair of the area within the department (if any). The department chair may confer with the instructor to handle the problem. Step B applies only in departmentalized colleges.
- C. If these discussions are not adequate to settle the matter to the complainant's satisfaction, the student may then confer with the dean of the college concerned (or the dean-designate), who will review the case. If unresolved, the dean or designate may refer the case to the college academic grievance hearing committee to review the case formally. In most instances, however, the grievance procedure does not go beyond this level.

Formal. The following procedure takes place after steps A, B, and C (or A and C) have been completed.

- D. Each college has on file in the office of the dean (and in each department of the college) the procedures and composition of the undergraduate or graduate academic grievance hearing committee for student grievances. Each college committee shall operate under grievance procedures as stated, which satisfy due process requirements. The committee shall always meet with the student and the instructor in an attempt to resolve the differences. At the conclusion of the hearing, the committee shall send its recommendations to the dean.
- E. Final action in each case is taken by the dean after full consideration of the committee's recommendation. Grade changes, if any are recommended, may be made by the dean. The dean shall inform the student, instructor, department chair (if any), the registrar, and the grievance committee of any action taken.

Scholarship

To be eligible for a degree in the Graduate College, a student must achieve two GPAs of "B" (3.00) or higher. The first GPA is based on all courses numbered 500 or higher that appear on the transcript. (Courses noted as deficiencies in the original letter of admission are not included.) The second GPA is based on all courses that appear on the program of study.

Graduate students (degree or nondegree) may retake any courses at any level at ASU, but all grades remain on the student transcript as well as in GPA calculations.

Academic excellence is expected of students doing graduate work. Upon recommendation from the head of the academic unit, the dean of the Graduate College can withdraw a student who is not progressing satisfactorily.

The designation of honors (*summa cum laude*, *magna cum laude*, and *cum laude*) is reserved for undergraduates. The Graduate College does not use these academic distinctions.

Graduate Credit Courses

Courses at the 500, 600, and 700 levels are graduate credit courses. Courses at the 400 level apply to graduate degree requirements when appearing on an approved pro-

gram of study. However, 400-level courses are not graduate courses by definition and cannot be certified as such for purposes of employment or transferring to other institutions.

Reserving of Course Credit by Undergraduates. Seniors at ASU within 12 semester hours of graduation may enroll in a 400-level or graduate course and reserve the credit for possible use in a future graduate program. The course cannot be used to meet a baccalaureate graduation requirement, however. Before registration in the class, the student must submit a Graduate College Petition form requesting credit reservation; the form must be signed by the student's advisor, the head of the academic unit offering the class, and the dean of the Graduate College.

Permission to reserve a course does not guarantee admission to a graduate degree program or that the course may be used toward graduate degree requirements. A maximum of nine hours of credit may be reserved, and only courses with an "A" or "B" grade are applicable. Reserved credit earned before admission to a graduate degree program is classified as nondegree credit. The maximum course load for a student enrolled in a reserved course is 15 semester hours during a regular semester and six hours during a summer session.

Transfer Credit. Transfer of credit is the acceptance of credit from another institution for inclusion in a program of study leading to a degree awarded by ASU. The number of hours transferred from other institutions may not exceed 20 percent of the total minimum semester hours required for a master's degree unless stated otherwise for a specific degree program.

Transfer credit taken before admission to a graduate degree program at ASU Main or East is nondegree credit. Nondegree credit taken at ASU Main or East combined with nondegree credit taken at another institution may not exceed nine hours on the master's program of study. The nine-hour limit does not apply to doctoral programs.

The date (month/day/year) on the Graduate College dean's letter of admission is the actual date of admission. If the student is enrolled in courses on the admission date, those courses—if applicable—may be considered part of a program of study. Courses taken the semester before this date are nondegree hours. Courses taken at ASU West are considered transferred credit.

Certain types of graduate credits cannot be transferred to ASU, including the following:

1. credits awarded by postsecondary institutions in the United States that lack candidate status or accreditation by a regional accrediting association;
2. credits awarded by postsecondary institutions for life experience;
3. credits awarded by postsecondary institutions for courses taken at noncollegiate institutions (e.g., government agencies, corporations, and industrial firms);
4. credits awarded by postsecondary institutions for noncredit courses, workshops, and seminars offered by other postsecondary institutions as part of continuing education programs; and
5. credits given for extension courses.

Acceptable academic credits earned at other institutions that are based on a different unit of credit than the ones pre-

scribed by the Arizona Board of Regents are subject to conversion before being transferred to ASU.

Transfer credits must be acceptable toward graduate degrees at the institution where the courses were completed. Only resident graduate courses (at the institution where the courses were completed) with an “A” or “B” grade may be transferred. A course with the grade of pass, credit, or satisfactory may not be transferred.

Official transcripts of any transfer credit to be used on a program of study must be sent directly to the Graduate Admissions Office from the Office of the Registrar at the institution where the credit was earned.

Graduate Supervisory Committees

When the program of study is filed, upon the recommendation of the head of the academic unit, the dean of the Graduate College appoints a graduate student’s supervisory committee, consisting of a chair and other resident faculty members. The number of members serving on this committee depends on the degree program.

Academic professionals (e.g., research scientists, research engineers), nontenure-track faculty (e.g., adjunct professors, research professors), and individuals granted affiliated faculty status through established university procedures may serve as cochairs, members, or extra members of thesis and dissertation committees upon approval by the Graduate College. Individuals who are recommended by an academic unit as eligible to serve as a cochair must meet the criteria established by the academic unit and be approved by the Graduate College.

Upon the recommendation of the committee chair and head of the academic unit, ASU West tenured (or tenure-track) faculty may serve on master’s and doctoral committees at ASU Main. ASU West tenured (or tenure-track) faculty may serve as cochairs for theses and dissertations at ASU Main upon the recommendation of the head of the academic unit and approval of the dean of the Graduate College. Cochairs must meet the academic unit’s criteria for chairing theses and dissertations.

Qualified individuals outside the university, upon the recommendation of the head of the academic unit and approval of the Graduate College, may serve as members of thesis and dissertation committees; however, such individuals may not serve as chairs or cochairs (unless they have affiliated faculty status). With the approval of the academic unit and the dean of the Graduate College, former ASU faculty with students completing their degrees may continue to serve as cochairs. At least 50 percent of the committee must be faculty from ASU Main.

Foreign Language Requirements

A graduate degree program may require proficiency in a foreign language. If a foreign language is required, students must demonstrate at least a reading knowledge in the area of study required by the supervisory committee and consistent with the requirements for the graduate degree program. Normally, the language is selected from French, German, Russian, or Spanish, although other languages may be recommended when there is adequate justification.

Students who are required to demonstrate proficiency in a foreign language must pass a foreign language examination specific to their particular graduate program. The examinations are administered three times each year by the Department of Languages and Literatures, which certifies language

competency. Students planning to take the examination must register in the Graduate College at least one month in advance of the examination date. The chair of the student’s supervisory committee is responsible for providing the Department of Languages and Literatures with materials from which the examination is then prepared. The chair should submit or recommend relevant books or journals of approximately 200 pages in length in the desired foreign language.

A student may petition the Graduate College for a re-examination but must pass the examination in no more than three attempts.

Theses and Dissertations

The master’s thesis or equivalent is an introduction to research writing. All doctoral degree candidates must submit a dissertation, with the exception of the Doctor of Musical Arts degree in Music (concentrations in choral conducting and solo performance), which requires three recitals and a research paper. The Ph.D. dissertation should be a valuable educational experience that demonstrates the candidate’s mastery of research methods, theory, and tools of the discipline. It should demonstrate the candidate’s ability to address a major intellectual problem and to propose meaningful questions and hypotheses. The dissertation should be a contribution to knowledge that is worthy of publication by an established press as a book or monograph or as one or more articles in a reputable journal.

For format, the Graduate College must review the final copy of the master’s thesis, doctoral dissertation, and other final documents that are required to be placed in the library. Copies of the *Format Manual* are available in the Graduate College and at www.asu.edu/graduate/fr_search.html on the Web. The student is required to submit a complete copy of the thesis or dissertation for format review at least 10 working days (two weeks if there are no holidays during the time period) before the oral defense. Doctoral students must submit a completed Survey of Earned Doctorates Awarded in the United States, conducted by the National Research Council.

Graduate students and their supervisory committee chairs jointly select a style guide or journal format representative of the field of study. The Graduate College allows certain flexibility in the format of the manuscript, but Graduate College and library guidelines must be followed.

The student must submit two final copies of a thesis or dissertation to the ASU Bookstore for binding. The student is responsible for the binding fees. Bound copies are placed in the Hayden Library and Archives. Doctoral students must submit one copy of the title page, approval page, and abstract (which must not exceed 350 words); the original signature of the doctoral student must appear on the University Microfilms International (UMI) Dissertation Agreement Form. The student is responsible for the UMI microfilming fee, which covers the expense of having the document sent to UMI, where it is microfilmed and catalogued. Information on the dissertation will appear in *Dissertation Abstracts International*.

Application for Graduation

Students should apply for graduation no later than the date specified in the “Graduate College Calendar,” found in the *Graduate Catalog*. All fees are payable at that time. Students applying for graduation after the deadline listed in the

calendar are required to pay a late fee. At the end of the semester in which they apply for graduation, students are officially notified of any requirements for their degree that they have not yet completed.

Students are requested to complete a questionnaire that serves as a graduate student exit survey.

Students who do not complete all degree requirements by their anticipated graduation date are required to pay a refiling fee.

Summer Sessions

Work taken during the summer sessions carries the same scholastic recognition as that taken during the regular semester. A complete schedule of offerings is available in the *Summer Sessions Bulletin*, which may be obtained from the Office of Summer Sessions.

Dates and Deadlines

The “Graduate College Calendar,” in the current *Graduate Catalog*, lists deadlines for the submission of theses and dissertations to the Graduate College, the last day to apply for graduation, the last day to hold an oral defense of a thesis or dissertation, and the last day to submit theses and dissertations to the ASU Bookstore for binding.

Student Responsibility

It is the responsibility of the graduate student to know and observe all procedures and requirements of the Graduate College as defined in the *Graduate Catalog*, the *Schedule of Classes*, and the *Format Manual*. Each student should also be informed about the requirements concerning the student’s degree program and any special requirements within the academic unit.

ACADEMIC INTEGRITY

The highest standards of academic integrity are expected of all students. The failure of any student to meet these standards may result in suspension or expulsion from the uni-

versity and/or other sanctions as specified in the academic integrity policies of the individual colleges.

Violations of academic integrity include, but are not limited to, cheating, fabrication, tampering, plagiarism, or facilitating such activities.

The university academic integrity policy is available at the Office of the Senior Vice President and Provost, or as part of the *Student Affairs Policies and Procedures Manual*— STA 104-01, at www.asu.edu/aad/manuals/sta/sta104-01.html on the Web.

MISCONDUCT IN SCHOLARLY RESEARCH AND CREATIVE ACTIVITIES

Students are expected to maintain the highest standards of integrity and truthfulness in scholarly research and creative activities. Misconduct in scholarly research and creative activities includes, but is not limited to, fabrication, falsification or misrepresentation of data, and plagiarism. Misconduct by any student may result in suspension or expulsion from the university and other sanctions as specified by the individual colleges. Policies on misconduct are available in the Office of the Vice Provost for Research and on the Web at www.asu.edu/aad/manuals/rsp/rsp111.html.

Graduate College Policies and Procedures

For more detailed information on Graduate College policies and procedures, see the current *Graduate Catalog*.

Policies and Procedures of the Graduate Council Appeals Board

The Graduate Council Appeals Board (GCAB) acts as the appeals body for graduate students seeking redress on academic decisions regarding their graduate program. Before filing an appeal, the graduate student should discuss the situation with the associate dean of the Graduate College to explore resolution of the matter at the unit or college level.

For more detailed information on the Graduate Council appeals policies and procedures, see the current *Graduate Catalog*.

ASU Graduate Degrees

Graduate degrees, majors, and concentrations offered by ASU Main, ASU East, and ASU West and through ASU Extended Campus are shown in the “ASU Graduate Degrees” table, on this page, organized by the name of the major. The table includes only officially approved concentrations; other informal areas of study may be available.

ASU offers these graduate degrees, abbreviated in the table below and elsewhere in the catalog:

Master of Accountancy and Information Systems (M.A.I.S.)
 Master of Architecture (M.Arch.)
 Master of Arts (M.A.)
 Master of Business Administration (M.B.A.)
 Master of Computer Science (M.C.S.)
 Master of Counseling (M.C.)
 Master of Education (M.Ed.)
 Master of Engineering (M.E.)
 Master of Environmental Planning (M.E.P.)
 Master of Fine Arts (M.F.A.)
 Master of Health Services Administration (M.H.S.A.)

Master of Mass Communication (M.M.C.)
 Master of Music (M.M.)
 Master of Natural Science (M.N.S.)
 Master of Physical Education (M.P.E.)
 Master of Public Administration (M.P.A.)
 Master of Public Health (M.P.H.)
 Master of Science (M.S.)
 Master of Science in Design (M.S.D.)
 Master of Science in Engineering (M.S.E.)
 Master of Science in Technology (M.S.Tech.)
 Master of Social Work (M.S.W.)
 Master of Taxation (M.Tax.)
 Master of Teaching English as a Second Language (M.TESL)
 Doctor of Education (Ed.D.)
 Doctor of Musical Arts (D.M.A.)
 Doctor of Philosophy (Ph.D.)
 Doctor of Public Administration (D.P.A.)
 Juris Doctor (J.D.)

ASU Graduate Degrees

Major	Degree	Concentration	Campus
Accountancy and Information Systems	M.A.I.S.	—	Main
Aerospace Engineering	M.S., M.S.E., Ph.D.	—	Main
Agribusiness	M.S.	Agribusiness management and marketing, food quality assurance	East
Anthropology	M.A.	Archaeology, bioarchaeology, linguistics, medical anthropology, museum studies, physical anthropology, social-cultural anthropology	Main
	Ph.D.	Archaeology, physical anthropology, social-cultural anthropology	Main
Architecture	M.Arch.	—	Main
Art	M.A.	Art education, art history	Main
	M.F.A.	Ceramics, drawing, fibers, intermedia, metals, painting, photographic studies, photography, printmaking, sculpture, wood	Main
Asian Languages and Civilizations—Chinese/Japanese	M.A.	—	Main
Bioengineering	M.S., Ph.D.	—	Main
Biology ¹	M.S., Ph.D.	Ecology	Main
Building Design	M.S.	Computer-aided design, energy performance and climate-responsive architecture, facilities development and management	Main

¹ This major has formalized concentration(s); other areas of study are available.

² Applications are not being accepted at this time.

³ This collaborative program is offered by the three state universities.

⁴ This major is jointly offered with the University of Arizona.

⁵ Students apply to this degree program through the College of Law, not the Graduate College.

ASU Graduate Degrees (continued)

Major	Degree	Concentration	Campus
Business Administration	M.B.A.	—	Main West Extended
	Ph.D.	Accountancy, computer information systems, finance, health services research, ² management, marketing, supply chain management	Main
Chemical Engineering	M.S., M.S.E., Ph.D.	—	Main
Chemistry	M.S., Ph.D.	Analytical chemistry, biochemistry, geochemistry, inorganic chemistry, organic chemistry, physical chemistry, solid-state chemistry	Main
Civil Engineering	M.S., M.S.E., Ph.D.	—	Main
Communication	M.A.	—	Main
	Ph.D.	Communicative development, intercultural communication, organizational communication	Main
Communication Disorders	M.S.	—	Main
Communication Studies	M.A.	—	West
Composition	M.M.	—	Main
Computer Science	M.C.S., M.S., Ph.D.	—	Main
Construction	M.S.	Construction science, facilities, management	Main
Counseling	M.C.	—	Main
Counseling Psychology	Ph.D.	—	Main
Counselor Education	M.Ed.	—	Main
Creative Writing	M.F.A.	—	Main
Criminal Justice	M.A.	—	West
Curriculum and Instruction	M.A.	Bilingual education, communication arts, early childhood education, elementary education, English as a second language, Indian education, mathematics education, reading education, science education, secondary education, social studies education	Main
	M.Ed.	Bilingual education, communication arts, early childhood education, elementary education, English as a second language, Indian education, mathematics education, professional studies, reading education, science education, secondary education, social studies education	Main
	Ed.D.	Secondary education Bilingual education, communication arts, curriculum studies, early childhood education, elementary education, English as a second language, Indian education, language and literacy, mathematics education, science education, secondary education, social studies education	Extended Main

¹ This major has formalized concentration(s); other areas of study are available.

² Applications are not being accepted at this time.

³ This collaborative program is offered by the three state universities.

⁴ This major is jointly offered with the University of Arizona.

⁵ Students apply to this degree program through the College of Law, not the Graduate College.

ASU Graduate Degrees (continued)

Major	Degree	Concentration	Campus
Curriculum and Instruction (continued)	Ph.D.	Art education, curriculum studies, early childhood education, educational media and computers, ² elementary education, English education, exercise and wellness education, language and literacy, mathematics education, music education, physical education, science education, special education	Main
Dance	M.F.A.	—	Main
Design	M.S.D.	Graphic design, industrial design, interior design	Main
Economics	M.S., Ph.D.	—	Main
Educational Administration and Supervision	M.Ed.	—	Main
	Ed.D.	—	West Main Extended
Educational Leadership and Policy Studies	Ph.D.	—	Main
Educational Psychology	M.A., M.Ed.	—	Main
	Ph.D.	Learning; lifespan developmental psychology; measurement, statistics, and methodological studies; school psychology	
Educational Technology	M.Ed.	—	Main
	Ph.D.	—	Main
Electrical Engineering	M.S., Ph.D.	—	Main
	M.S.E.	—	Main Extended
Elementary Education	M.Ed.	Bilingual education, educational media and computers, ESL education, reading	West
Engineering ³	M.E.	—	Main Extended
Engineering Science	M.S., M.S.E., Ph.D.	—	Main
English	M.A.	Comparative literature, English linguistics, literature and language, rhetoric and composition	Main
	Ph.D.	Literature, rhetoric/composition and linguistics	Main
Environmental Design and Planning	Ph.D.	Design; history, theory, and criticism; planning	Main
Environmental Planning	M.E.P.	Landscape ecological planning, urban and regional development, urban design	Main
Environmental Resources	M.S.	GIS/remote sensing, natural resource management, range ecology	East
Exercise and Wellness	M.S.	—	East
Exercise Science	Ph.D.	Biomechanics, motor behavior/sport psychology, physiology of exercise	Main
Exercise Science/Physical Education	M.S.	—	Main
Family and Human Development	M.S.	Family studies	Main
Family Science ¹	Ph.D.	Marriage and family therapy	Main

¹ This major has formalized concentration(s); other areas of study are available.

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⁵ Students apply to this degree program through the College of Law, not the Graduate College.

ASU Graduate Degrees (continued)

Major	Degree	Concentration	Campus
French	M.A.	Comparative literature, linguistics, literature	Main
Geography	M.A., Ph.D.	—	Main
Geological Sciences	M.S., Ph.D.	—	Main
German	M.A.	Comparative literature, language and culture, literature	Main
Health Services Administration	M.H.S.A.	—	Main
Higher and Postsecondary Education	M.Ed., Ed.D.	Higher education	Main
History	M.A.	Asian history, British history, European history, Latin American history, public history, U.S. history, U.S. Western history	Main
	Ph.D.	Asian history, British history, European history, Latin American history, U.S. history	Main
History and Theory of Art ⁴	Ph.D.	—	Main
Humanities	M.A.	—	Main
Industrial Engineering	M.S., M.S.E., Ph.D.	—	Main
Information Management	M.S.	—	Main
Interdisciplinary Studies	M.A.	—	West
Justice Studies	M.S.	—	Main
	Ph.D.	Criminal and juvenile justice; dispute resolution; law, justice, and minority populations; law, policy, and evaluation; women, law, and justice	Main
Law ⁵	J.D.	—	Main
Mass Communication	M.M.C.	—	Main
Materials Engineering	M.S., M.S.E.	—	Main
Materials Science	M.S.	—	Main
Mathematics	M.A., Ph.D.	—	Main
Mechanical Engineering	M.S., M.S.E., Ph.D.	—	Main
Microbiology	M.S., Ph.D.	—	Main
Molecular and Cellular Biology	M.S., Ph.D.	—	Main
Music	M.A.	Ethnomusicology, music history and literature, music theory	Main
	D.M.A.	Choral conducting, music composition, music education, solo performance (instrumental, keyboard, piano pedagogy, voice)	Main
Music Education	M.M.	Choral music, general music, instrumental music, jazz studies	Main
Natural Science	M.N.S.	Biology, chemistry, geological sciences, mathematics, microbiology, physics, plant biology	Main
Nursing	M.S.	Adult health nursing, community health nursing, community mental health/psychiatric nursing, family health nursing, nursing administration, parent-child nursing, women's health	Main

¹ This major has formalized concentration(s); other areas of study are available.

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⁵ Students apply to this degree program through the College of Law, not the Graduate College.

ASU Graduate Degrees (continued)

Major	Degree	Concentration	Campus
Nutrition	M.S.	—	East
Performance	M.M.	Music theatre/opera musical direction, music theatre/ opera performance, performance pedagogy, piano accompanying, solo performance (instrumental, keyboard, voice)	Main
Philosophy	M.A., Ph.D.	—	Main
Physical Education	M.P.E.	—	Main
Physics	M.S., Ph.D.	—	Main
Plant Biology ¹	M.S., Ph.D.	Ecology, photosynthesis	Main
Political Science	M.A., Ph.D.	American politics, comparative politics, international relations, political theory	Main
Psychology	Ph.D.	Behavioral neuroscience, clinical psychology, cognitive/behavioral systems, developmental psychology, environmental psychology, quantitative research methods, social psychology	Main
Public Administration	M.P.A.	Public information management, public management, public policy analysis and evaluation, urban manage- ment and planning	Main Extended
	D.P.A.	—	Main
Public Health ³	M.P.H.	Community health practice, health administration and policy	Main
Recreation	M.S.	—	Main
Religious Studies	M.A.	—	Main
Science and Engineering of Materials	Ph.D.	High-resolution nanostructure analysis, solid-state device materials design	Main
Secondary Education	M.Ed.	Educational media and computers	West
Social and Philosophical Foundations of Education	M.A.	—	Main
Social Work	M.S.W.	Advanced direct practice; planning, administration, and community practice	Main
	Ph.D.	—	West Main
Sociology	M.A., Ph.D.	—	Main
Spanish	M.A.	Comparative literature, language and culture, linguistics, literature	Main
	Ph.D.	Cultural studies literature	
Special Education	M.A., M.Ed.	— Infants and young children	Main West
	Ph.D.	Developmental neurolinguistic disorders, neuroauditory processes, neurogerontologic communication disorders	Main
Statistics	M.S.	—	Main
Taxation	M.Tax.	—	Main
Teaching English as a Second Language	M.TESL	—	Main

¹ This major has formalized concentration(s); other areas of study are available.

² Applications are not being accepted at this time.

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ASU Graduate Degrees (continued)

Major	Degree	Concentration	Campus
Technology	M.S.Tech.	Aeronautical engineering technology, aviation human factors, aviation management technology, computer systems engineering technology, electronic systems engineering technology, environmental technology management, fire service administration, global technology and development, information technology, instrumentation and measurement technology, management of technology, manufacturing engineering technology, mechanical engineering technology, microelectronics engineering technology, security engineering technology	East
Theatre	M.A. M.F.A. Ph.D.	— Performance, scenography, theatre for youth Theatre for youth	Main Main Main

¹ This major has formalized concentration(s); other areas of study are available.

² Applications are not being accepted at this time.

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⁵ Students apply to this degree program through the College of Law, not the Graduate College.

Concurrent and Dual Degrees

Concurrent or Dual Degrees	Administered By	Campus
Juris Doctor/Master of Health Services Administration	College of Law/School of Health Administration and Policy	Main
Juris Doctor/Master of Science in Economics*	College of Law/Department of Economics	Main
Juris Doctor/Doctor of Philosophy in Justice Studies	College of Law/Committee on Law and Social Sciences	Main
Master of Business Administration/Juris Doctor	College of Business/College of Law	Main
Master of Business Administration/Master of Accountancy and Information Systems	College of Business	Main
Master of Business Administration/Master of Architecture	College of Business/School of Architecture	Main
Master of Business Administration/Master of Health Services Administration	College of Business	Main
Master of Business Administration/Master of International Management	College of Business/American Graduate School of International Management (Thunderbird), Glendale, AZ; ESAN, Lima, Peru; Groupe Ecole Supérieure de Commerce (ESC), Toulouse, France; ITESM-CEM, Mexico City, Mexico; and Universidad Carlos III de Madrid, Madrid, Spain	Main
Master of Business Administration/Master of Science (Economics)	College of Business	Main
Master of Business Administration/Master of Science in Information Management	College of Business	Main
Master of Business Administration/Master of Taxation	College of Business	Main
Master of Science in Engineering (Industrial Engineering)/Master of International Management of Technology	Department of Industrial and Management Systems Engineering/American Graduate School of International Management (Thunderbird)	Main
Master of Science in Justice Studies/Master of Arts in Anthropology	School of Justice Studies/Department of Anthropology	Main
Master of Science in Nursing/Master of Health Services Administration	College of Nursing/School of Health Administration and Policy	Main

* Applications for this program are not being accepted at this time.

International Programs

William G. Davey, Ph.D., Director

ipo.asu.edu



Palacio Nacional, Mexico City

Julie Williams photo

PURPOSE

As an emerging world-class institution, Arizona State University seeks to interact with cultures throughout the world both from an intellectual and educational point of view. International Programs (IPO) endeavors to develop a global competence for students, faculty, and ASU as a whole. IPO therefore encourages students to study abroad, faculty to teach and conduct research in contact with scholars around the world, and academic units to develop fruitful forms of collaborative work with a variety of higher learning entities abroad.

The university, in its endeavors to fulfill these functions, takes notice of the rapidly changing conditions of the contemporary world. Canada and Mexico hold a special relationship as a result of proximity and membership in the North American Free Trade Agreement. Europe is developing as a supranational unit in the form of the European Community. The Pacific Rim constitutes one of the most dynamic economic regions of the world. All of these regions are interconnected through swiftly developing information channels, whose power is quickly changing the contours of higher education.

International Programs is administratively part of the Office of the Senior Vice President and Provost. Its functions include developing and administering university programs abroad, encouraging faculty participation in exchanges, and pursuing relationships with foundations and agencies intent on furthering the international character of ASU.

ACADEMIC PROGRAMS

Two types of programs—study abroad and student exchange—are designed to enhance the international perspectives of students.

Study Abroad Programs. Study abroad programs are arrangements with educational institutions in foreign countries; ASU students can study in these institutions and, at the completion of their period of study—normally either a semester or a full academic year—earn ASU resident credit for the courses taken. Outgoing ASU students are charged a program fee, and arrangements are usually made for accommodations and other needs. ASU registration fee and tuition waivers are not normally applicable toward the costs of study abroad programs. Financial aid such as scholarships, grants, and loans may, in most cases, be applied to program costs. Once on site, ASU students may be placed in special classes created for them, or they may study alongside students from other countries.

Study abroad programs generally fall into one of three categories: language immersion programs, “island” programs, and programs in which courses are offered in English. ASU immersion programs, in which students learn the language of the host country with little or no previous

language knowledge, include programs in Germany, Israel, Italy, Mexico, and Portugal. “Island” programs are those in which students take courses taught in the host country’s language and frequently live with host families. The courses are designed to be offered to foreign (not host country) students. ASU offers such programs in France and Spain. Programs in which students can take courses taught in English are offered in the United Kingdom but may also be offered at certain institutions in non-English speaking countries.

Exchange Programs. Exchange programs are those in which a small number of ASU students may study at a foreign institution, in return for which students from that institution have a reciprocal opportunity to study at ASU. ASU students pay their normal registration fees and tuition at ASU. In general, ASU registration fees and tuition may be paid by scholarships or waivers. Financial aid may, in most cases, be applied to the costs of exchange programs. As in the case of study abroad programs, ASU students earn ASU resident credit on these exchange programs. Exchange programs offer students the chance to enter mainstream university life in the country of their choice. Normally participation in an exchange program is dependent on prior attainment of an adequate level of language competence to be able to function in classes in the host country.

In several instances, students may have the opportunity to undergo advanced-level intensive language instruction for approximately one month in the host country before the start of the academic term. The costs of these intensive language programs are not included in tuition and registration fees paid to ASU for an exchange.

In addition to Canada and Australia, ASU has exchange agreements in several countries in Latin America, Asia, and Europe. Program availability is under constant review.

Area Studies Programs. International Programs maintains close liaison with ASU’s area studies programs, including the Center for Asian Studies, the Latin American Studies Center, and the Program for Southeast Asian Studies, among others.

Related Programs. Close relationships are maintained with a number of academic units on campus. The Barrett Honors College cooperates in the creation of special programs for the benefit of its students. The Department of Languages

and Literatures assists in the staffing and management of a number of study abroad programs, especially those related to language acquisition. The College of Business maintains an advising service for College of Business students intending to study abroad. The College of Engineering and Applied Sciences and the Corporate Leaders Program also actively place students in study programs and internships around the world.

Procedures. Students interested in participating in such programs should identify their interests as soon as possible—in the freshman year if language learning is to be involved. Students should express their interests to the International Programs office in MOEUR 124; if need be, students are directed to other offices. It is essential to consult with a departmental program advisor, since the return of credits ultimately depends on the concurrence of the faculty advisors. Students on an official study abroad or exchange program retain the catalog status they held at the time of their departure.

Information on the status of programs can be obtained from the International Programs Office in MOEUR 124, from the International Programs Web page at ipo.asu.edu, or by phone at 480/965-5965.

Before participating in a study abroad or an exchange program, students are required to complete an information package. An interview is then conducted and students are later required to attend an orientation that may last more than one day. Program fees as applicable have to be paid and deadlines met. Students should keep themselves informed of any applicable refund procedures, noting that, since study abroad and exchange arrangements sometimes commit the university, refunds are not always possible in full or in part.

OTHER ACTIVITIES

International Programs seeks to encourage a wide range of other academic activities. These activities include exchanges of faculty members and the development of institutional relationships with universities overseas to encourage joint research projects. The office also assumes responsibility for a considerable number of visitors who come from overseas to visit the ASU campus.

Summer Sessions

Carol Switzer, M.S., Director

www.asu.edu/ssc



Chris Hamlin performs during the annual tuba concert in Cady Fountain.

Tim Trumble photo

PURPOSE

The summer sessions, offering more than 3,000 fully accredited courses, provide an opportunity for students to begin or continue academic work on a year-round basis. Summer courses are equivalent to fall and spring courses in terms of content, credit awarded, and the standards expected of students regarding academic performance.

There are three regular sessions, one of eight weeks and two of five weeks. The eight-week session and the first five-week session begin the same date. See the “University Calendar,” page 14, for specific dates.

All ASU Main courses (except some EPE courses) are held in air-conditioned classrooms or laboratories. A limited number of courses are offered at off-campus locations.

During the summer, ASU also offers students the opportunity to earn graduate or undergraduate credit while studying in foreign countries through various Summer Study Programs. These programs are directed by ASU faculty and have been approved by the appropriate academic unit.

For more information, visit the Summer Sessions Web site at www.asu.edu/ssc.

Admission and Registration. The admission and registration process for summer sessions begins when the *Summer Sessions Bulletin* is distributed during the last week of January.

Admission. All students must be admitted to ASU for the summer as a nondegree student before enrolling, except for continuing students attending ASU during the spring semester preceding the current summer. New ASU students admitted for the fall semester following the current summer must process the summer nondegree admission form before enrolling.

Nondegree Graduate or Undergraduate. An application form is provided in the *Summer Sessions Bulletin*. The submission of transcripts or test scores is not required for this status.

Readmission. ASU students not enrolled during the spring semester preceding the current summer must be readmitted. See “Readmission to the University,” page 65.

Conditional admission before graduation from high school may be granted. See “Admission Before Receipt of Final Transcript,” page 55.

Advising. All students are strongly encouraged to seek academic advising before enrolling in summer courses. See “Academic Advising,” page 64.

Bulletin. The *Summer Sessions Bulletin*, which contains the class schedule, the application form, and the registration procedure, is available the last week of January at the Office of Summer Sessions, ADM B167, and at all registrar sites. The *Summer Sessions Bulletin* is also available on the Web at www.asu.edu/ssc.

To request the *Summer Sessions Bulletin*, summer study abroad brochures, or other summer information, call 480/965-6611 or write

SUMMER SESSIONS
ARIZONA STATE UNIVERSITY
PO BOX 873003
TEMPE AZ 85287-3003

Food Services. Meal plans are available. For more information, call 480/965-3464 or write

SODEXHO MARRIOTT SERVICES
ARIZONA STATE UNIVERSITY
PO BOX 870901
TEMPE AZ 85287-0901

Housing. Air-conditioned dormitories are available for ASU Main students. For more information, call 480/965-3515 or write

RESIDENTIAL LIFE
ARIZONA STATE UNIVERSITY
PO BOX 870801
TEMPE AZ 85287-0801

Immunization. Students born after December 31, 1956, are not permitted to register without proof of measles (rubeola) immunity or immunization given after January 1, 1980. See "Immunization Requirements," page 60.

Parking. A decal is required to park at ASU. For more information, call 480/965-6124 or write

PARKING SERVICES
ARIZONA STATE UNIVERSITY
PO BOX 870704
TEMPE AZ 85287-0704

Registration. Registration may be completed in person or by using InTouch. See the *Summer Sessions Bulletin*.

A maximum of seven semester hours in each five-week session or nine semester hours in the eight-week session may be taken. Hours of enrollment in any other institution or independent learning course are included in the maximum allowable course load during any given session.

Tuition and Fees. Summer sessions students pay for the actual number of semester hours enrolled, plus the Associated Students' Association fee, the Financial Aid Trust Fee, and the Student Recreation Complex fee. Students are also required to pay any special fees attached to specific classes. See the *Summer Sessions Bulletin*.



John Findley participates in one of the many games held during Sparky's Beach Party—2000 Homecoming.

Tim Trumble photo

ASU Main Directory

Organization	Location	Telephone	Web Address
Academic Transfer Articulation Office	AG 272	480/965-2476	www.asu.edu/provost/articulation
Academic Transfer Programs	AG 272 B1	480/965-2476	www.asu.edu/admissions/transfercenter
Course Equivalency Guide	AG 272 B2	480/965-9172	www.asu.edu/provost/articulation
General Studies Guides	AG 272 B2	480/727-6599	www.asu.edu/provost/articulation
Transfer Guides	AG 272	480/965-8332	www.asu.edu/provost/articulation
Accounts Receivable	ADM A109	480/965-6341	—
Admissions	—	—	—
Adult Reentry	MU 14	480/965-2252	www.asu.edu/studentlife/reentry
Graduate	WILSN 101	480/965-6113	www.asu.edu/graduate/admission
Law	LAW 101	480/965-1474	www.law.asu.edu
Readmissions (Undergraduate)	SSV 142	480/965-7440	www.asu.edu/registrar/readmissions
Undergraduate	SSV 112	480/965-7788	www.asu.edu/admissions
Architecture and Environmental Design, College of	ARCH 134	480/965-8169	www.asu.edu/caed
Architecture, School of	AED 162	480/965-3536	www.asu.edu/caed/architecture
Design, School of	AED 154	480/965-4135	www.asu.edu/caed/design
Herberger Center for Design Excellence	ARCH 119	480/965-6693	www.asu.edu/caed/herberger
Planning and Landscape Architecture, School of	AED 158	480/965-7167	www.asu.edu/caed/planning
Arizona Drug and Gang Prevention Resource Center	ASUDC B2	480/727-5015 1-888-432-2347	www.asu.edu/adgprc
Arizona Prevention Resource Center	ASUDC B2	480/727-2772 1-888-432-2772	www.asu.edu/aprc
Associated Students of ASU (ASASU)	MU 310	480/965-3161	www.asu.edu/asasu
ASU Alumni Association	MAIN 200	480/965-2586	www.asu.edu/alumni
Administration	MAIN 200	480/965-2086	
Alumni Publications/ASU Vision Magazine	MAIN 200	480/727-6280	
Alumni Relations	MAIN 200	480/965-5276	
Alumni Travel	MAIN 200	480/965-0099	
Business Office	MAIN 200	480/965-9357	
Campuses, Chapters, and College Associations	MAIN 200	480/965-5276	
Career Programs	MAIN 200	480/965-5074	
Membership/Marketing	MAIN 200	480/965-8346	
Records Department	MAIN 200	480/965-2127	
Reunions and Traditions	MAIN 200	480/965-4282	
Scholarships/Alumni Development	MAIN 200	480/965-4034	
Student Relations	MAIN 200	480/965-7754	
Sun Devil Advocates (Grass Roots)	MAIN 200	480/965-4078	
ASU West Alumni Programs	FAB S363	602/543-5315	
ASU East ¹	—	480/727-3278	www.east.asu.edu
ASU Extended Campus ²	—	480/965-9696	www.asu.edu/xed
ASU Main	—	480/965-9011	www.asu.edu
ASU West ³	—	623/543-5500	www.west.asu.edu
Bookstore, ASU	BKSTR	480/965-7928	bookstore.asu.edu
Business, College of	BA 123	480/965-4227	www.cob.asu.edu
Accountancy and Information Management, School of	BA 223	480/965-3631	www.cob.asu.edu/acct
Economics, Department of	BAC 659	480/965-3531	www.cob.asu.edu/ecn
Finance, Department of	BAC 519	480/965-3131	www.cob.asu.edu/fin

¹ See "ASU East Directory," page 662.

² See "ASU Extended Campus Directory," page 691.

³ See "ASU West Directory," page 674.

Organization	Location	Telephone	Web Address
Business, College of (continued)			
Business Administration (M.B.A.)	—	480/965-3332	www.cob.asu.edu/mba
Business Administration (Ph.D.)	—	480/965-3368	www.cob.asu.edu/grad/phd
Health Administration and Policy, School of	BA 318	480/965-7778	www.cob.asu.edu/hap
International Business Studies	BA 122	480/965-4066	www.cob.asu.edu/up/ipo.cfm
Management, Department of	BA 323	480/965-3431	www.cob.asu.edu/mgt
Marketing, Department of	BAC 460	480/965-3621	www.cob.asu.edu/mkt
Supply Chain Management, Department of	BA 446	480/965-6044	www.cob.asu.edu/scm
Small Business, Center for the Advancement of	BAC 111	480/965-3962	www.cob.asu.edu/up/smallbusiness.cfm
Campus Dining Services	MU 138	480/965-3464	www.asu.edu/mu/campusdining
Career Services	SSV 329	480/965-2350	career.asu.edu
Cashiering Services	SSV 244	480/965-7468	—
Child and Family Services	MU 14C	480/965-9515	www.asu.edu/vpsa/family
Cocurricular Programs	MCL 109B	480/965-9600	www.asu.edu/vpsa/partnerships
Community Service Program	MU 303	480/965-2255	www.asu.edu/vpsa/community
Counseling and Consultation	SSV 334	480/965-6146	www.asu.edu/counseling_center/index1.html
	SHS A168	480/965-4726	—
Creative Writing (M.F.A.)	LL 307C	480/965-3528	www.asu.edu/clas/english/creativewriting
Disability Resources for Students	MCENT	—	www.asu.edu/drs
TTY	—	480/965-9000	—
Voice	—	480/965-1234	—
Drop/Add and Withdrawal Information	SSV 140	480/965-3124	—
Education, College of	EDB 108	480/965-3306	www.ed.asu.edu/coe
Bilingual Education, Center for	ED 440	480/965-7134	www.asu.edu/educ/cber
Computer Support/Student Computer Lab	EDB 122	480/965-2126	—
Curriculum and Instruction, Division of	ED 426	480/965-1644	www.ed.asu.edu/coe/candi
Curriculum and Instruction, Graduate Program Office	ED 434	480/965-4602	is.asu.edu/coe
Dean's Office	EDB 104	—	courses.ed.asu.edu/deanos
Educational Leadership and Policy Studies, Division of	ED 120	480/965-3538	bers.asu.edu
Educational Research and Services, Bureau of	EDB 140	480/965-6357	www.coe.asu.edu/elps
Indian Education, Center for	ED 402	480/965-6292	www.asu.edu/educ/cie
Professional Field Experiences, Office of (Student Teaching)	EDB L1-14	480/965-6255	www.ed.asu.edu/coe/pfe
Psychology in Education Admissions Information (Recording, Voice Mail)	—	480/965-6420	—
Psychology in Education, Division of	EDB 302	480/965-3384	www.coe.asu.edu/psyched
Student Affairs, Office of (Academic Advising and Certification)	EDB L1-13	480/965-5555	www.asu.edu/educ/osa
Student Affairs, Office of (Recruitment and Support Programs) (Tutoring Scholarships)	EDB L1-19	480/965-5555	www.asu.edu/educ/osa
Educational Opportunity Center	1000 E Apache No. 118	480/894-8451	www.asu.edu/studentlife/eoc
Engineering and Applied Sciences, College of	ECG 100	480/965-3421	www.eas.asu.edu
Bioengineering, Department of	ECG 202	480/965-3028	www.eas.asu.edu/~bme
Chemical and Materials Engineering, Department of	ECG 202	480/965-3313	www.eas.asu.edu/~cbme

¹ See "ASU East Directory," page 662.

² See "ASU Extended Campus Directory," page 691.

³ See "ASU West Directory," page 674.

Organization	Location	Telephone	Web Address
Engineering and Applied Sciences, College of (continued)	ECG 100	480/965-3421	www.eas.asu.edu
Civil and Environmental Engineering, Department of	ECG 252	480/965-3589	www.eas.asu.edu/~civil
Computer Science and Engineering, Department of	GWC 206	480/965-3190	www.eas.asu.edu/~csedep
Construction, Del E. Webb School of	SCOB 241	480/965-3615	ceaspub.eas.asu.edu/dewsc
Electrical Engineering, Department of	ENGR 552	480/965-3424	www.eas.asu.edu/ee
Engineering, School of	ECG 104	480/965-1726	—
Industrial Engineering, Department of	GWC 502	480/965-3185	www.eas.asu.edu/~imse
Mechanical and Aerospace Engineering, Department of	ECG 346	480/965-3291	www.eas.asu.edu/~mae
Equal Opportunity/ Affirmative Action TTY	ADM B171 —	480/965-5057 480/965-0471	www.eoaa.asu.edu —
Exercise Science (Ph.D.)	PEBW M201	480/965-7906	www.asu.edu/clas/espe
Extended Education, College of ²	DTC C319	480/965-9696	www.asu.edu/xed
FASTT (Financial Aid Services Through Technology)	—	480/968-4400	www.asu.edu/fastt
Fine Arts, Herberger College of	GHALL 132	480/965-6536	herbergercollege.asu.edu
Art, School of	ART 102	480/965-3468	herbergercollege.asu.edu/art
Dance, Department of	PEBE 107B	480/965-5029	herbergercollege.asu.edu/dance
Music, School of	MUSIC E183	480/965-3371	herbergercollege.asu.edu/music
Theatre, Department of	GHALL 232	480/965-5359	herbergercollege.asu.edu/theatre
Gerontology (Certificate)	WHALL 116	480/965-3225	www.asu.edu/graduate/gerontology
Graduate College	WILSN lobby	480/965-3521	www.asu.edu/graduate
Admissions	WILSN 101	480/965-6113	www.asu.edu/graduate/fr_appy.html
Advising Office	WILSN lobby	480/965-3521	www.asu.edu/graduate/checklist.html#ADVISING
Financial Assistance	WILSN 120	480/965-3521	www.asu.edu/graduate/gradaid
Format Office	—	480/965-3521	—
General Office	—	480/965-3521	—
Scholarships	—	480/965-3521	—
Graduation Section	—	—	www.asu.edu/registrar/graduation
Commencement Office	ADM B167	480/965-6611	www.asu.edu/ssc/commence
Graduate Division	SSV 140	480/965-6980	—
Undergraduate Division	SSV 140	480/965-3256	—
Greek Life	MU 305	480/965-2255	www.asu.edu/vpsa/greeklife
HOME (Housing Options Made Easy)	—	480/303-3434	www.asu.edu/reslife
Honors College, Barrett	IRISH A121	480/965-2359	www.asu.edu/honors
Information Technology	—	—	www.asu.edu/it
Computer Accounts Office	CPCOM 105	480/965-1211	www.asu.edu/computeraccounts
Computing Site Hours	—	480/965-6500	www.asu.edu/it/fyi/sites/comphourscat.html
Computing Sites	CPCOM atrium	480/965-4459	www.asu.edu/computingsites
	BAC 16	480/965-3074	—
	ECG 150	480/965-6280	—
	GWC 185	480/965-4307	—
Customer Assistance Center	CPCOM 202	480/965-5939	www.asu.edu/cacenter
Geographic Information Systems Lab	CPCOM 235	480/965-4007	www.asu.edu/gislab
Help Desk	CPCOM 202	480/965-6500	www.asu.edu/helpdesk
Instruction Support Lab	CPCOM 213	480/965-6739	is.asu.edu
Visualization Services	CPCOM 235	480/965-9699	www.asu.edu/visualization
International Programs Office	MOEUR 124	480/965-5965	ipo.asu.edu
International Student Office	SSV 265	480/965-7451	www.asu.edu/studentlife/iso
International Undergraduate Admissions	SSV 101	480/965-2688	www.asu.edu/admissions/applyingtoasu
InTouch	—	480/350-1500	www.asu.edu/registrar/registration/intouch.html

¹ See "ASU East Directory," page 662.

² See "ASU Extended Campus Directory," page 691.

³ See "ASU West Directory," page 674.

Organization	Location	Telephone	Web Address
Justice Studies (Ph.D.)	WILSN 316	480/965-7682	www.asu.edu/copp/justice/home.htm
Law, College of	LAW 101	480/965-6181	www.law.asu.edu
Admissions Office	—	480/965-1474	—
TTY	—	480/965-2048	—
Learning Resource Center	SSV 394	480/965-6254	www.asu.edu/vpsa/lrc
Liberal Arts and Sciences, College of	SS 111	480/965-6506	www.asu.edu/clas
Aerospace Studies, Department of	TC 324	480/965-3181	www.asu.edu/clas/afrotc
African American Studies	HEC 227	480/965-4399	www.asu.edu/clas/aftramstu
Anthropology, Department of	ANTH 233	480/965-6213	www.asu.edu/clas/anthropology
Biology, Department of	LS C226	480/965-3571	lifesciences.asu.edu/biology
Chemistry and Biochemistry, Department of	PS D102	480/965-3461	www.asu.edu/clas/chemistry
Chicana and Chicano Studies, Department of	COWDN 224	480/965-5091	www.asu.edu/clas/chicana
English, Department of	LL 542	480/965-3168	www.asu.edu/clas/english
Exercise Science and Physical Education, Department of	PEBW M212	480/965-3875	www.asu.edu/clas/espe
Family and Human Development, Department of	COWDN 106	480/965-6978	www.asu.edu/clas/frhd
Geography, Department of	SCOB 340H1	480/965-7533	geography.asu.edu
Geological Sciences, Department of	PS F686	480/965-5081	geology.asu.edu
History, Department of	SS 204	480/965-5778	www.asu.edu/clas/history
Interdisciplinary Humanities Program	LL 641	480/965-6747	www.asu.edu/clas/humanities
Languages and Literatures, Department of	LL 440	480/965-6281	www.asu.edu/clas/dll
Mathematics, Department of	PS A216	480/965-3951	math.la.asu.edu
Microbiology, Department of	LS E210	480/965-1457	lifesciences.asu.edu/microbiology/
Molecular Bioscience and Biotechnology	LS E218	480/965-3414	lifesciences.asu.edu/mbb
Molecular and Cellular Biology	LSE 441	480/965-0743	ls.la.asu.edu/mcb/
Military Science, Department of	TC B100	480/965-3318	www.asu.edu/clas/military
Philosophy, Department of	PS A524	480/965-3394	www.asu.edu/clas/philosophy
Physics and Astronomy, Department of	PS F470	480/965-3561	phy.asu.edu
Plant Biology, Department of	LS E218	480/965-3414	lifesciences.asu.edu/plantbiology
Political Science, Department of	SS 410	480/965-6551	www.asu.edu/clas/polisci
Psychology, Department of	PSY 237	480/965-3326	www.asu.edu/clas/psych
Religious Studies, Department of	ECA 377	480/965-7145	www.asu.edu/clas/religious_studies
Sociology, Department of	SS 321	480/965-3546	www.asu.edu/clas/sociology
Speech and Hearing Science, Department of	LL 173A	480/965-2374	www.asu.edu/clas/shs
Women's Studies Program	ECA 209	480/965-2358	www.asu.edu/clas/womens_studies
Libraries (See "University Libraries," page 527.)			
Memorial Union	MU	—	www.asu.edu/mu
Administrative Offices	MU mezzanine	480/965-5310	www.asu.edu/mu/staff.html
Event Meeting Services	MU 1st level	480/965-3406	www.asu.edu/mu/ems.html
Information Desk	MU 1st level	480/965-5728	—
Lost and Found	MU 1st level	480/965-5728	—
Sun Devil Involvement Center	MU 3rd level	480/965-2255	www.asu.edu/mu/sdic.html
Multicultural Student Center	SSV 394	480/965-6060	www.asu.edu/studentlife/mssc
New Student Programs	SSV 110	480/965-2880	www.asu.edu/admissions/newstudentprograms
Nursing, College of	NUR 344	480/965-3244	www.asu.edu/nursing
Community Health Services Clinic	—	480/941-9283	www.asu.edu/nursing/chs
Continuing and Extended Education	CSB 334	480/965-7431	www.asu.edu/nursing/ce
Graduate Program	NUR 444	480/965-3948	www.asu.edu/nursing
Student Service Office	NUR 108	480/965-2987	www.asu.edu/nursing/studentsservices
Operator, University	—	480/965-9011	—

¹ See "ASU East Directory," page 662.

² See "ASU Extended Campus Directory," page 691.

³ See "ASU West Directory," page 674.

Organization	Location	Telephone	Web Address
Parents Association (Programs)	SSV 110	480/965-2602	www.asu.edu/admissions/parentprograms
Parking and Transit Services	TOWER 107	480/965-6406	www.asu.edu/dps/pts
Public Programs, College of	WILSN 234	480/965-1034	www.asu.edu/copp
Advanced Public Executive Program	ASUDC C110	480/965-4006	www.asu.edu/copp/apep
American Indian Studies Program	AG 372	480/965-3634	www.asu.edu/copp/americanindian
Asian Pacific American Studies Program	AG 352	480/965-9711	www.asu.edu/copp/asianamerican
Human Communication, Hugh Downs School of	STAUF A412	480/965-5095	com.pp.asu.edu
Journalism and Telecommunication, Walter Cronkite School of	STAUF A231	480/965-5011	www.asu.edu/cronkite
Justice Studies, School of	WILSN 331	480/965-7682	www.asu.edu/copp/justice
Morrison Institute for Public Policy	UVCMN 203	480/965-4525	www.asu.edu/copp/morrison
Nonprofit Leadership and Management, Center for	AG 346	480/965-0607	www.asu.edu/copp/nonprofit
Public Affairs, School of	WILSN 208	480/965-3926	spa.asu.edu
Recreation Management and Tourism, Department of	MOEUR 131	480/965-7291	www.asu.edu/copp/recreation
Social Work, School of	WHALL 135	480/965-3304	ssw.asu.edu
Urban Inquiry, Center for	AG 320B	480/965-9216	www.asu.edu/copp/urban
Readmissions (Undergraduate)	SSV 142	480/965-7440	www.asu.edu/registrar/readmissions
Registrar	SSV 140	—	www.asu.edu/registrar
Expedite	—	480/968-5988	www.asu.edu/registrar/general/expedite.html
InTouch	—	480/350-1500	www.asu.edu/registrar/registration/intouch.html
TTY	—	480/965-3236	—
Voice	—	480/965-3124	—
Residency Classification	SSV 170	480/965-7712	www.asu.edu/registrar/residency
Residential Life	SSV 170	480/965-3515	www.asu.edu/reslife
Science and Engineering of Materials (Ph.D.)	PS B135	480/965-2460	www.asu.edu/graduate/SEM
Speech and Hearing Science (Ph.D.)	CSB 146	480/965-2373	www.asu.edu/clas/shs
Statistics (M.S.)	BAC 570	480/965-2671	www.asu.edu/graduate/statistics
Student Affairs Research and Evaluation Office	MU 14D	480/965-4070	www.asu.edu/vpsa/research
Student Aid Disbursement	SSV 235	480/965-2956	www.asu.edu/fastt/apply/disbursement.html
Student Business Services	ADM A105	480/965-6301	—
Student Development	MU 182	480/965-7313	www.asu.edu/vpsa/sd
Student Employment	SSV 202	—	www.asu.edu/fa/studemp
Off-Campus	—	480/965-6318	—
On-Campus	—	480/965-5186	—
Student Financial Assistance	SSV 216A	480/965-3355	www.asu.edu/fastt
Student Foundation	MU 340	480/965-5731	—
Student Health and Wellness Center	SHS	480/965-3346	www.asu.edu/health
Appointments	—	480/965-3349	—
Fax	—	480/965-8914	—
Measles Information	—	480/965-1358	—
Student ID (Sun Card)	MU 190	480/965-2273	www.suncard1.com
Student Leadership Programs	MU 340	480/965-2255	www.asu.edu/vpsa/slp
Student Life	SSV 263	480/965-6547	www.asu.edu/studentlife
Student Media	MCENT 2	480/965-7572	www.statepress.com/aboutus
State Press Advertising	—	480/965-6555	www.statepress.com/spress
State Press Information	—	480/965-7572	—
State Press Newsroom	—	480/965-2292	—
Web Devil	—	480/727-6941	www.statepress.com

¹ See "ASU East Directory," page 662.

² See "ASU Extended Campus Directory," page 691.

³ See "ASU West Directory," page 674.

Organization	Location	Telephone	Web Address
Student Organization Resource Center	MU 340	480/965-2255	www.asu.edu/clubs
Student Recreation Complex and Recreational Sports	SRC 220	480/965-8900	www.asu.edu/src
Summer Sessions, Office of	ADM B167	480/965-6611	www.asu.edu/ssc
Summer International Programs	AG 313	480/965-6611	www.asu.edu/ssc/StudyAbroad
Testing Support Services	SSV 322	480/965-6777	www.asu.edu/uts
Tickets	—	—	—
Athletic Events, Intercollegiate (Sun Devil Ticket Office)	—	480/965-2381	—
Gammage Box Office	GGMA	480/965-3434	—
Public Event information	—	480/965-5062	—
Transcripts (Outgoing)	SSV 140B	480/965-7276	www.asu.edu/registrar/transcripts
Transportation Systems (Certificate)	ARCH 119	480/965-6395	eastair.east.asu.edu/transportation
Tuition Payment Office	SSV 235	480/965-4347	—
Undergraduate Academic Services, Division of	UASB	480/965-3097	www.asu.edu/duas
Academic Success at the University (UNI 100 and 101) (Student Success Center)	ED 410	480/965-3097	www.asu.edu/duas/uni100
Bachelor of Interdisciplinary Studies (B.I.S.)	UASB 200	480/965-1970	www.asu.edu/duas/bis
Campus Match	ED 410	480/965-3097	www.asu.edu/duas/campmat
Cross-College Advising Services	UASB 129	480/965-4464	www.asu.edu/duas/cas
Declaration of Graduation	—	—	www.asu.edu/duas/dog
Degree Audit Reporting System (DARS)	UASB 100	480/965-8012	www.asu.edu/duas/dars
General Studies Program	UASB 230	480/965-0739	www.asu.edu/duas/genstudies
Service Learning	UASB 200	480/727-6657	www.asu.edu/duas/servlearn
Summer Bridge	ED 410	480/965-3097	www.asu.edu/duas/bridge
Supplemental Instruction	ED 410	480/965-3097	www.asu.edu/duas/si
Writing Across the Curriculum Support and Development	ED 410	480/965-3097	www.asu.edu/duas/wac
Writing Center	LL 340	480/965-4272	www.asu.edu/duas/wcenter
University Evaluation, Office of	AG 281	480/965-9291	www.asu.edu/oue
University Libraries	LIB	480/965-6164	www.asu.edu/libraries
Archives and Manuscripts, Department of	LIB 413	480/965-3145	www.asu.edu/lib/archives
Architecture and Environmental Design Library	AED 153	480/965-6400	www.asu.edu/caed/AEDlibrary/
East Campus Library	CNTR	480/727-1037	eastlib.east.asu.edu
Hayden Library (Circulation Desk)	LIB	480/965-3605	www.asu.edu/lib/hayden
Library Administration	LIB	480/965-3417	—
Music Library	MUSIC W302	480/965-3513	www.asu.edu/lib/music
Noble Science and Engineering Library	NOBLE	480/965-2600	—
Reference Questions	—	480/965-4932	—
Ross-Blakley Law Library	LAWLB	480/965-6141	www.lawlib.asu.edu
Video Resources	ECA 100	480/965-5046	www.asu.edu/lib/video
West Campus Library	FLHLB	602/543-8501	www.west.asu.edu/library
University Testing Services	EDB 301	480/965-7146	www.asu.edu/uts
Upward Bound	SSV 276	480/965-6483	www.asu.edu/studentlife/ub/main.html
Veterans Services Section	SSV 148	480/965-7723	www.asu.edu/registrar/veterans
Veterans Upward Bound	1000 E Apache No. 106	480/965-3944	www.asu.edu/studentlife/vub
Winter Session	—	480/965-9797	www.asu.edu/xed/wntsrssn.html

¹ See "ASU East Directory," page 662.

² See "ASU Extended Campus Directory," page 691.

³ See "ASU West Directory," page 674.

Regents' Professors

The title "regents' professor" is conferred on selected members of the ASU tenured faculty who have achieved and are sustaining the highest level of distinction by their exceptional contributions to the mission of the university in research or other creative activity and in teaching or professional service.



JOHN ALCOCK
Biology



JEFFREY COOK
Architecture



RONALD GREELEY
Geology



DAVID L. ALTHEIDE
Justice Studies



JOHN M. COWLEY
*Physics and Astronomy
Emeritus*



DAVID R. HICKMAN
Music



C. AUSTEN ANGELL
Chemistry and Biochemistry



NORMAN DUBIE
English



PETER IVERSON
History



CONSTANTINE A. BALANIS
Electrical Engineering



NANCY H. EISENBERG
Psychology



DAVID H. KAYE
Law



DAVID C. BERLINER
*Educational Leadership and
Policy Studies and
Psychology in Education*



LEROY EYRING
*Chemistry and Biochemistry
Emeritus*



GARY D. KELLER
Spanish



PETER R. BUSECK
*Chemistry and Biochemistry
and Geology*



DAVID K. FERRY
Electrical Engineering



RAYMOND W. KULHAVY
Psychology in Education



ROBERT B. CIALDINI
Psychology



DAVID WILLIAM FOSTER
Spanish



DANIEL M. LANDERS
*Exercise Science
and Physical Education*



SHENG H. LIN
Chemistry and Biochemistry
Emeritus



CAIO PAGANO
Music



JOHN C.H. SPENCE
Physics and Astronomy



JAMES W. MAYER
Chemical and Materials
Engineering



DENNIS J. PALUMBO
Justice Studies
Emeritus



MARY BETH STEARNS
Physics and Astronomy
Emeritus



LEE MEYERSON
Psychology
Emeritus



GEORGE R. PETTIT
Chemistry and Biochemistry



WILLIAM T. TROTTER
Mathematics



CARLETON B. MOORE
Chemistry and Biochemistry
and Geology



ALBERTO ALVARO RIOS
English



CHRISTY G. TURNER II
Anthropology



JEFFRIE G. MURPHY
Law and Philosophy



NANCY FELIPE RUSSO
Psychology



J. BRUCE WAGNER JR.
Center for Solid-State
Science and
Chemistry and Biochemistry
Emeritus



MICHAEL O'KEEFE
Chemistry and Biochemistry



DAVID J. SMITH
Physics and Astronomy and
Center for Solid-State Science



KURT WEISER
Art

ASU Main Faculty and Academic Professionals

The faculty and academic professionals listed are involved in undergraduate and graduate instruction and research. The year of first appointment follows the name. Emeriti are included.

A

Aanenson, Todd (2000), Faculty Associate of Construction; B.S., Arizona State University

Aannestad, Per (1975), Associate Professor of Physics and Astronomy; B.S., University of Oslo (Norway); Ph.D., University of California, Berkeley

Abbaszadegan, Morteza (1999), Associate Professor of Civil and Environmental Engineering and Adjunct Faculty of Microbiology; B.S., University of Montana; M.S., Northern Arizona University; Ph.D., University of Arizona

Abele, Deborah (1990), Faculty Associate of Planning and Landscape Architecture; B.A., Vassar College

Aberle, James T. (1989), Associate Professor of Electrical Engineering; B.S., M.S., Polytechnic Institute of New York; Ph.D., University of Massachusetts, Boston

Abramson, Jay (1999), Lecturer of Mathematics; B.S., University of New Mexico; M.S., University of New Hampshire

Abston, Deborah (1990), Associate Librarian, Hayden Reference Services; B.S., M.S.L.S., Wayne State University

Acereda, Alberto (1998), Assistant Professor of Latin American Literature; Licenciado, University of Barcelona (Spain); M.A., Ph.D., University of Georgia

Acevedo, Roberto M. (1964), Professor Emeritus of Spanish; B.A., University of California, Berkeley; M.A., Ph.D., University of Arizona

Acharya, Raghunath (1976), Associate Professor of Physics and Astronomy; B.Sc., M.Sc., University of Delhi (India); Ph.D., University of Rochester

Acker, Barbara (1991), Associate Professor of Theatre; B.F.A., University of Texas, Austin; M.A., Case Western Reserve University; Ph.D., Wayne State University

Acker, William J. (1970), Professor Emeritus of Geography; B.S., Purdue University; M.S., University of Kansas; M.A., Ph.D., Syracuse University

Adams, Donna (1983), Associate Professor of Nursing; B.S.N., University of Missouri, Columbia; M.S., Arizona State University; D.N.Sc., University of San Diego

Adams, James B. (1996), Professor of Materials Engineering; Interim Codirector, Science and Engineering of Materials; B.S., Duke University; M.S., Ph.D., University of Wisconsin, Madison

Adams, Karen L. (1984), Professor of English; Director, Program for Southeast Asian Studies; B.A., M.A., Ph.D., University of Michigan

Adelman, Madelaine (1998), Assistant Professor of Justice Studies; A.B., Ph.D., Duke University

Adelson, Roger D. (1974), Professor of History; B.A., George Washington University; B.Litt., University of Oxford (United Kingdom); M.A., Ph.D., Washington University

Aerni, Wayne (1991), Faculty Associate of Public Affairs; B.A., University of Oregon; M.P.A., D.P.A., Arizona State University

Agadjanian, Victor (1995), Assistant Professor of Sociology; B.A., Moscow State University (Russia); M.S., Ph.D., University of Southern California

Aguiar, John L. (1976), Professor Emeritus of Anthropology; B.A., University of California, Los Angeles; M.A., California State University, Los Angeles; Ph.D., University of California, San Diego

Ahn, Seung C. (1990), Associate Professor of Economics; B.A., Sogang University (Korea); M.A., Ph.D., Michigan State University

Ahrendt, Laurie (2000), Faculty Associate of Nursing; B.S.N., M.S., Arizona State University

Aiken, Leona S. (1985), Professor of Psychology; B.S., Virginia Commonwealth University; M.S., Ph.D., Purdue University

Akins, William H. (1975), Professor Emeritus of Theatre; B.A., Duke University; M.A., Ph.D., University of Denver

Alarcon, Ricardo O. (1989), Professor of Physics and Astronomy; B.S., M.S., University of Chile (Chile); Ph.D., Ohio University

Alberts, Jess K. (1989), Professor of Communication; Director, Hugh Downs School of Human Communication; B.S.Ed., M.A., Abilene Christian University; Ph.D., University of Texas, Austin

Alcock, John (1972), Regents' Professor of Biology; B.A., Amherst College; Ph.D., Harvard University

Alcorn, Marianne (1981), Law Librarian, Reference; B.A., University of Washington; M.L.S., University of Southern California

Aldama, Arturo (1996), Assistant Professor of Chicana and Chicano Studies; B.A., Evergreen State University; M.A., Ph.D., University of California, Berkeley

Aldrich, Frank T. (1969), Professor Emeritus of Geography; B.A., University of Texas, Austin; M.S., Ph.D., Oregon State University

Alexander, Robert J. (1975), Professor of German; B.A., Macalester College; M.A., Ph.D., University of Wisconsin, Madison

Alford, Terry L. (1993), Associate Professor of Materials Engineering; B.S., M.S., North Carolina State University, Raleigh; Ph.D., Cornell University

Alisky, Marvin (1957), Professor Emeritus of Political Science; B.A., M.A., Ph.D., University of Texas, Austin

Allee, David R. (1991), Associate Professor of Electrical Engineering; B.S., University of Cincinnati; M.S., Ph.D., Stanford University

- Allen, Craig M.** (1991), Associate Professor of Journalism and Telecommunication; B.A., Linfield College; M.S., University of Oregon; Ph.D., Ohio University
- Allen, James P.** (1989), Professor of Chemistry and Biochemistry; B.S., Saint Joseph's University; M.S., Ph.D., University of Illinois
- Allen, Jonathan** (2001), Assistant Professor of Chemical Engineering and Civil and Environmental Engineering; B.S., University of Pennsylvania; M.S., Sc.D., Massachusetts Institute of Technology
- Allison, Maria T.** (1984), Professor of Recreation Management and Tourism; B.S., M.S., University of New Mexico; Ph.D., University of Illinois
- Alozie, Nicholas O.** (1991), Associate Professor of Public Affairs; B.A., M.P.A., Texas Southern University; M.A., Ph.D., University of Texas, Dallas
- Alpers, Rojann** (1995), Associate Professor of Nursing; B.S.N., M.S., Arizona State University; Ph.D., University of Iowa
- Alquist, Lewis R.** (1984), Professor of Art; B.F.A., Florida Atlantic University; M.F.A., Cranbrook Academy of Art
- Altheide, David L.** (1973), Regents' Professor of Justice Studies; Interim Director, Justice Studies Master's Program; B.A., Central Washington State College; M.A., University of Washington; Ph.D., University of California, San Diego
- Alvarado, Ronald H.** (1974), Professor Emeritus of Biology; B.A., University of California, Riverside; M.S., Ph.D., Washington State University
- Alvarez, Robert R. Jr.** (1989), Professor of Anthropology; B.A., Northern Arizona University; M.A., San Diego State University; M.A., Ph.D., Stanford University
- Amazeen, Eric P.** (1999), Assistant Professor of Psychology; B.A., Franklin and Marshall College; M.A., Ph.D., University of Connecticut
- Amazeen, Polemnia G.** (1999), Assistant Professor of Psychology; B.A., Franklin and Marshall College; M.A., Ph.D., University of Connecticut
- Ames, James G.** (1985), Senior Research Associate, Manufacturing Institute; B.S., San Diego State University
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College of Education

Dean, College of Education	David C. Berliner
Associate Dean, Teacher Education	Nicholas R. Appleton
Interim Associate Dean, Academic Programs and Personnel	Sarah J. Hudelson
Associate Dean, Research	Gene V. Glass
Assistant Dean, Office of Student Affairs	Inta "Maggie" Tolan
Director, Division of Curriculum and Instruction	Nicholas R. Appleton
Associate Director of Research and Graduate Education, Division of Curriculum and Instruction	Robert B. Rutherford Jr.
Associate Director for Professional Development and Induction, Division of Curriculum and Instruction	Billie Enz
Associate Director of Initial Teacher Certification, Division of Curriculum and Instruction	Frederick Staley
Director, Division of Educational Leadership and Policy Studies	Terrence G. Wiley
Academic Program Coordinator, Educational Administration and Supervision	Donna J. Macey
Academic Program Coordinator, Education Policy Studies	Mary Lee Smith
Academic Program Coordinator, Social and Philosophical Foundations	Eric Margolis
Academic Program Coordinator, Higher and Post-Secondary Education	Robert H. Fenske
Director, Division of Psychology in Education	Elsie G.J. Moore
Training Director and Academic Program Leader, Counseling Psychology	Terence Tracey
Academic Program Leader, Counselor Education	Terence Tracey
Interim Training Director, Educational Technology	James D. Klein
Academic Program Leader, Educational Psychology	Edward A. Nelsen
Interim Training Director, School Psychology	Raymond W. Kulhavy
Director, Center for Bilingual Education and Research	Josué M. González
Director, Bureau of Educational Research and Services	Margaret A. Mangini
Director, Center for Indian Education	Octaviana Trujillo
Director, Counselor Training Center	Judith Homer
Director, Office of Professional Field Experiences	To Be Appointed

College of Engineering and Applied Sciences

Dean, College of Engineering and Applied Sciences	Peter E. Crouch
Associate Dean, Academic Affairs	Daniel F. Jankowski
Associate Dean, Planning and Administration	Ben M. Huey
Associate Dean, Research	Gregory B. Raupp
Associate Dean, Student Affairs and Special Programs	Mary R. Anderson-Rowland
Director, Del E. Webb School of Construction	William W. Badger

Director, School of Engineering	Daniel F. Jankowski
Chair, Department of Bioengineering	Eric J. Guilbeau
Chair, Department of Chemical and Materials Engineering	Subhash Mahajan
Chair, Department of Civil and Environmental Engineering	Sandra L. Houston
Chair, Department of Computer Science and Engineering	To Be Appointed
Chair, Department of Electrical Engineering	Stephen M. Goodnick
Chair, Department of Industrial Engineering	Gary L. Hogg
Chair, Department of Mechanical and Aerospace Engineering	To Be Appointed
Director, Engineering Core and Special Studies	Daniel F. Jankowski
Director, Center for Research on Education in Science, Mathematics, Engineering, and Technology	Donovan L. Evans
Codirector, Center for Low Power Electronics	Dieter K. Schroder
Director, Center for Professional Development	Charles S. Elliott
Director, Center for Solid-State Electronics Research	Michael Kozicki
Director, Center for System Science and Engineering Research	Frank C. Hoppensteadt
Director, Manufacturing Institute	Thomas E. Callarman
Interim Director, Telecommunications Research Center	Joseph Y. Hui

College of Extended Education

See "ASU Extended Campus Administrative Personnel," page 691.

College of Law

Dean, College of Law	Patricia D. White
Associate Dean	Hannah R. Arterian
Associate Dean and Director, Ross–Blakley Law Library	Victoria K. Trotta
Assistant Dean, Administrative and Business Services	Rhonda Sandler
Assistant Dean and Director of Admissions	Brenda Brock
Assistant Dean, Student Services	Leslie Mamaghani
Development Officer	Susan Mathew
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Director, Communications	Jodi Weisberg
Director, Center for the Study of Law, Science, and Technology	Daniel S. Strouse
Associate Director, Center for the Study of Law, Science, and Technology	Andrew Askland
Director, Clinical Programs	Catherine O'Grady
Director, Development	Tom Stevick
Director, Legal Research and Writing and Academic Success Program	Judith M. Stinson
Executive Director, Indian Legal Program	Rebecca A. Tsosie
Associate Director, Indian Legal Program	Kate Rosier

College of Liberal Arts and Sciences

Interim Dean, College of Liberal Arts and Sciences	Linell E. Cady
Associate Dean	Milton R. Sommerfeld
Associate Dean, Academic Programs	Leonard Gordon
Associate Dean, Administration and Personnel	Nancy A. Gutierrez
Chair, Department of Aerospace Studies	Col. Ronald Scott, Jr.
Chair, Department of Anthropology	John K. Chance
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Chair, Department of Sociology	Verna M. Keith

Chair, Department of Speech and Hearing Science	David Ingram
Director, African American Studies	Leonor Boulin Johnson
Director, Center for Asian Studies	Timothy Wong
Director, Cancer Research Institute	G. Robert Pettit
Director, Center for the Study of Early Events in Photosynthesis	Andrew N. Webber
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Associate Dean for Undergraduate Programs and Extended Education	Mary Killeen
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Chair, Division of Adult Health/Parent-Child Nursing	Frances Thurber
Chair, Division of Community Health/Psychosocial Nursing Systems	Betty J. Gale
Manager, Community Health Services Clinic	Elizabeth Holman

College of Public Programs

Dean, College of Public Programs	Anne L. Schneider
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Director, Hugh Downs School of Human Communication	Jess K. Alberts
Director, Walter Cronkite School of Journalism and Telecommunication	Joe S. Foote
Director, School of Justice Studies	<i>To Be Appointed</i>
Director, School of Public Affairs	Jeffrey Chapman
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Senior Program Coordinator, General Studies	Phyllis Lucie
Senior Business Manager	Kathleen Renshaw

Graduate College

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Associate Dean, Student Support Services	Marjorie S. Zatz
Associate Dean, Academic Programs	Deborah N. Losse
Assistant Dean, Academic Programs	Sarah B. Lindquist
Assistant Dean, Administrative Services and Information Systems	Kent D. Blaylock

Herberger College of Fine Arts

Dean, Herberger College of Fine Arts	J. Robert Wills
Director, School of Art	Julie F. Codell
Chair, Department of Dance	Claudia Murphey
Director, School of Music	Wayne A. Bailey
Chair, Department of Theatre	<i>To Be Appointed</i>

Interim Director, Institute for Studies in the Arts Daniel L. Collins
 Director, Undergraduate Student Academic Services Gina Stephens
 Director, ASU Art Museum Marilyn A. Zeitlin

University Libraries

Dean, University Libraries Sherrie Schmidt
 Associate Dean, Continuous Improvement/Total Quality Service *To Be Appointed*
 Associate Dean, Library Services Jane A. Conrow
 Associate Dean, Video Resources *To Be Appointed*
 Assistant Dean, Personnel Kurt R. Murphy
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 Head, Department of Archives and Manuscripts Robert P. Spindler
 Head, Government Documents/Map Collection Rebecca Burke
 Interim Head, Interlibrary Loan and Document Delivery Virginia Sylvester
 Head, Library Instruction, Systems, and Technology (LIST) Scott S. Herrington
 Head, Music Library Robert E. Follet
 Head, Preservation Lois I. Schneberger
 Head, Special Collections Marilyn J. Wurzburger
 Interim Head, Noble Science and Engineering Library Reference Services Linda A. Shackle
 Team Leader, Collection Development Jeanne Richardson
 Team Leader, Reference Services Lydia E. LaFaro
 Team Management, Technical Services Department Betsy J. Redman, Ronda L. Ridenour,
 and Rebecca S. Uhl

Administrative Services, ASU Main

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 Assistant Director, Construction and Design Management Vance Linden
 Assistant Director, Crafts Fred Giles
 Assistant Director, Custodial Services Charles Simonette
 Interim Assistant Director, Grounds Services Scott Cisson
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 Campus Planner Rick Collins
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 Manager, Computing Services Joe Metzger
 Manager, Engineering Ray Tena
 Manager, Human Resources Carrie McNamara-Segal
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 Associate Director, Human Resources Connie Wood
 Assistant Director, Human Resources Christine Cervantes
 Assistant Director, Human Resources Sue Madden
 Director/Chief of Police, Public Safety John Pickens
 Assistant Chief of Police Kay Gojkovich
 Director, Parking and Transit Linda Riegel
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 Director, ASU Bookstore Val Ross
 Director, Internal Audit and Management Services Walter B. Silva
 Director, Risk Management Robert Gomez

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 Basketball–Men. Rob Evans
 Basketball–Women Charli Turner Thorne
 Cross Country–Men. Walt Drenth
 Cross Country–Women Walt Drenth
 Diving–Men and Women. Mark Bradshaw
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 Golf–Men. Randy Lein
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 Soccer–Women Terri Patraw
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 Swimming–Women Michael Chasson
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 Track and Field–Men. Greg Kraft
 Track and Field–Women Greg Kraft
 Volleyball–Women. Patti Snyder-Park
 Wrestling–Men Lee Roy Smith

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 Associate Vice Provost for Research Ronald Barr
 Assistant to the Vice Provost Cynthia Ryan
 Senior Business Operations Manager Rich Fill
 Executive Director/Strategic Initiatives Patrick Burkhardt
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 Director, Office of Research Publications Conrad Storad
 Director, Center for Environmental Studies Charles L. Redman
 Director, Partnership for Research in Stereo Modeling Program (PRISM) Anshuman Razdan

Director, Animal Care Facility	Tedd A. Brandon
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Director, Arizona Prevention Resource Center	Gail Chadwick
Director, Career Services	Raymond I. Castillo
Director, Recreational Sports	Howard Taylor
Director, Residential Life and Assistant Dean, Student Development	Kevin Cook
Director, Student Financial Assistance	Diane Stemper
Director, Student Health and Wellness Center	Mary Rimza
Director, Student Media	Bruce D. Itule
Director, Undergraduate Admissions	Tim Desch
Registrar	Lou Ann Denny

University Continuous Improvement

Project Administrator	Jacquie Gentry
Program Coordinator	Vicki Harmon
Human Resources Specialist Senior	Patrick Patterson

ASU East

See "ASU East Administrative Personnel," page 667.

ASU Extended Campus

See "ASU Extended Campus Administrative Personnel," page 691.

ASU West

See "ASU West Administrative Personnel," page 682.

ASU East

**Charles E. Backus, Ph.D., Campus Chief Executive Officer
and Provost, ASU East; Vice President, ASU**

www.east.asu.edu



ASU East Student Union fountain

Dave Tevis photo

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Arizona State University East was established in 1996 at the former Williams Air Force Base, 23 miles southeast of ASU Main. There, ASU East and its educational partners have created the Williams Campus—a residential academic community focused on meeting the needs of students, business, industry, and the larger community. The 600-acre Williams Campus offers a small college environment, with access to the amenities of a major metropolitan area and the resources of a major research university.

ASU East offers degree programs that help students develop knowledge and skills they need for success in their professional, civic, and personal lives in the 21st century. Eighteen baccalaureate degree programs, five master's degree programs, and two certificate programs can be completed at ASU East, with additional programs in the planning stages. (See the "Morrison School of Agribusiness and Resource Management Baccalaureate Degrees and Majors" table, page 608, the "East College Baccalaureate Degrees and Majors" table, page 621, and the "College of Technology and Applied Sciences Baccalaureate Degrees and Majors" table, page 634.) The College of Technology and Applied Sciences offers a master's degree and a range of bachelor's programs in high demand areas of technology, the only programs of their kind in Arizona. The unique bachelor's and master's degrees in Agribusiness offered by the faculty in the Morrison School of Agribusiness and Resource Management lead to careers in one of the fastest growing sectors of global business. The Environmental Resources degrees offered through the Morrison School provide opportunities to study wilderness areas and urban habitats and how people's activities affect the regenerative ability of natural resources. East College offers a range of supporting courses for all ASU East programs and bachelor's degrees with majors in Business Administration, Applied Psychology, Nutrition, Elementary Education, Multimedia Writing and Technical Communication, Exercise and Wellness, and Interdisciplinary Studies. Students who are uncertain of their major may start college at ASU East as East College/No Preference majors.

Although it is a young campus, ASU East has already developed significant student-centered innovations in higher education that have earned national recognition.

ASU East assumed leadership in Arizona in developing and offering the Bachelor of Applied Science (B.A.S.) degree, a program designed specifically as a career progression degree for students holding the Associate of Applied Science (A.A.S.) degree. The B.A.S. emphasizes management, leadership, and communication skills, along with additional technical course work.

ASU East has also developed an innovative academic partnership with Chandler-Gilbert Community College (CGCC). This partnership combines the strengths of the two institutions to provide ASU students with high quality education in a cost-effective way. CGCC provides lower-division general education and major prerequisite courses that are directly equivalent to ASU courses and transfer automatically. ASU East provides both lower- and upper-division courses in the major and upper-division general studies and general interest courses. Through the partnership, students can get at the Williams Campus all the courses needed to graduate in four years with an ASU baccalaureate degree, generally at some savings in tuition.

New facilities, new programs, and new opportunities are constantly emerging at ASU East. The campus is easily accessible via major interstate routes. See the map on page 661. For the latest information, call 480/727-EAST (3278) or access the Web site at www.east.asu.edu.

Accreditation

The North Central Association of Colleges and Schools accreditation of ASU Main includes ASU East. In addition, ASU East programs in Aeronautical Engineering Technology, Electronics Engineering Technology, and Manufacturing Engineering Technology are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (TAC of ABET). For more information, call 410/347-7700 or write

TECHNOLOGY ACCREDITATION COMMISSION
OF THE ACCREDITATION BOARD FOR
ENGINEERING AND TECHNOLOGY INC
111 MARKET PLACE SUITE 1050
BALTIMORE MD 21202-7102

Both the airway science flight management and the airway science management concentration, in the Department of Aeronautical Management Technology, are fully accredited by the Council on Aviation Accreditation. For more information, call 334/844-2431, e-mail caa@auburn.edu, or write

COUNCIL ON AVIATION ACCREDITATION
3410 SKYWAY DRIVE
AUBURN AL 36830

ACADEMIC ORGANIZATION AND ADMINISTRATION

The chief operating and academic officer of ASU East is the provost. There are two colleges and one school at ASU East administered by deans. These academic units develop and implement the teaching, research, and service programs of the institution. Additional support for the academic mission of the campus is provided by Library Services and Information Technology, each administered by a director. See "ASU East Faculty and Academic Professionals," page 663, and "Academic Organization," page 8.

ADMISSION

Nondegree Students. Nondegree students may take courses at ASU East according to the special provisions under "Admission of Undergraduate Nondegree Applicants," page 60.

Degree-Seeking Students. Degree-seeking students must meet the university admissions standards set by the Arizona Board of Regents (ABOR). Any student admitted to ASU may take courses at ASU East. To be admitted to an ASU East degree program, the student must meet undergraduate admissions requirements and the specific admission requirements of the ASU East program. A student who is admitted to an ASU East degree program is defined as an ASU East student.

For more admissions information and applications to ASU East degree programs, call 480/727-EAST (3278) or write

UNDERGRADUATE ADMISSIONS
ARIZONA STATE UNIVERSITY
PO BOX 870112
TEMPE AZ 85287-0112

Academic Advising at ASU East

College or School	Location	Telephone	Days	Hours ¹
College of Technology and Applied Sciences	CNTR 10	480/727-1252	Mon.–Fri.	8 A.M.–5 P.M.
Craig and Barbara Barrett Honors College	IRISH A121 ²	480/965-2359	Mon.–Fri.	8 A.M.–5 P.M.
East College	CNTR 92	480/727-1515	Mon.–Fri.	8 A.M.–5 P.M.
Department of Nutrition	HSC 1345	480/727-1728	Tues., Thurs.	9 A.M.–5 P.M.
Morrison School of Agribusiness and Resource Management	CNTR 20	480/727-1585	Mon.–Fri.	8 A.M.–5 P.M.

¹ Walk-ins are welcome; appointments are recommended.

² The Barrett Honors College is located at ASU Main.

Transfer Among ASU Campuses

Degree-seeking students currently enrolled at either ASU Main or ASU West who want to relocate to an ASU East degree program should contact the OASIS at ASU East, the Office of the Registrar at ASU Main, or the Admissions and Records Office at ASU West for appropriate procedures. All credit earned at any ASU campus automatically transfers to ASU East. Students should consult with their ASU East major advisor to determine how this credit applies to their major and graduation requirements. Students should be aware that certain requirements (e.g., the minimum number of upper-division semester hours to graduate) may differ among campuses.

TRANSFER CREDIT

Courses taken from Chandler-Gilbert Community College through the Partnership in Baccalaureate Education are automatically transferred to ASU East each semester. These courses and courses taken at other Arizona public community colleges transfer according to equivalencies established in the current Arizona Higher Education Course Equivalence Guide. (Transfer guides are available at www.asu.edu/provost/articulation.) The acceptability and applicability of courses transferred from other universities and community colleges is determined by ASU Main Undergraduate Admissions in consultation with the faculty or academic advisor of the student's choice of major.

JOINT ADMISSION CONTINUOUS ENROLLMENT (JAC)

JAC 001 Joint Admission Continuous Enrollment. (0–12) F, S, SS For use by ASU East to track undergraduate students admitted to East Campus degree programs who are concurrently enrolled or solely enrolled in courses offered by Chandler-Gilbert Community College.

ADVISING

Students are encouraged to take advantage of the skill and knowledge of the advising professionals available to them in the academic units and to seek academic advising early.

For more information or to schedule an advising session, contact an academic advisor (see the “Academic Advising at ASU East” table, page 605).

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see “ASU Extended Campus,” page 683, or access the Web site at www.asu.edu/xed.

CAMPUS AND STUDENT SERVICES

ASU East is a student-centered campus that offers many of the features of a small residential college in a rural area while providing access to the resources of a major research university and the amenities of a large metropolitan area. The campus includes excellent educational facilities: modern classrooms and laboratories, a 21st-century electronic library, and state-of-the-art computer equipment. Other amenities include a learning center, child care services, campus union, bookstore, copy center, and free parking. A shuttle service provides transportation between ASU East, Mesa Community College, and ASU Main. An additional shuttle is available for transportation from ASU Main to ASU West.

Enrollment Services—OASIS

The OASIS provides one-stop services for admission, financial aid, business services, and registration. Conveniently located in the Academic Center Building, students find personnel ready to assist them with registration processes, tuition payment, financial assistance information, student employment, ASU Sun Cards (photo IDs), and parking information.

Student Affairs

Staff provide new student advising orientation programs, workshops, academic advising for undeclared majors, support for clubs and organizations, international and multicultural students, and students with disabilities. Staff also provide career advising and assessment, career planning workshops, career exploration software programs, and internship information.

Williams Campus Housing and Residential Life

Living on-campus at ASU East provides students with the best opportunity to make the most of their college experience. No matter which housing option students choose, the residential life program offers social, academic, and recreational activities that are designed to support and enrich the

student's campus life experience. Residential students benefit from easy access to campus resources such as the library, learning center, fitness center, and campus union; and parking is available for residents at no extra cost.

ASU East's unique residential environment offers housing options for Williams Campus students throughout their undergraduate and graduate education. This includes residence halls, houses, and special residential communities. Residential students can also take advantage of such amenities as outdoor swimming, sand volleyball, tennis, and picnic areas.

Freshman Year Experience Residence Hall. Freshmen can begin their on-campus living experience in a dedicated freshman residence hall that includes the Freshman Year Experience (FYE) program. The FYE program helps freshmen achieve academic and personal success by providing on-site tutoring and advising, as well as enhanced opportunities for student learning, campus involvement, and out of class interaction with faculty. Research has consistently shown that freshmen participating in living-learning communities, such as FYE, have greater academic success. The FYE residence hall offers two bedroom suites with a shared bath, to house four students. Each hall also features a computer lab, study area, and community lounge. An optional meal plan is offered through campus dining.

Residence Halls. Undergraduate and graduate students are eligible for residence halls with a large private room, featuring a private bath and a shared kitchenette. Students may, if they prefer, elect to share a room with another student. Each room includes basic furnishings; the kitchenette includes a refrigerator and microwave.

Houses. A large number of two-to-five bedroom houses are available for students with families or for groups of single undergraduate or graduate students. Each house includes basic furnishings.

Special residential communities. Special residential communities for honors students, students in particular academic majors, and students sharing common interest areas are also available.

All residential facilities are non-smoking. For more information, call the Williams Campus Housing Office at 480/727-1700, or access the Web site at www.asu.edu/east/cls/housing.

Library Services

Strong resources and personal service define the ASU East Library. As a primarily electronic research library, it is designed to take maximum advantage of new technology. Electronic indexes, catalogs, and journals support study and research in many fields, with an emphasis on the majors offered at ASU East. While the library acquires materials in all formats, by intention it prefers electronic text. Thousands of periodicals are available digitally in all subjects, while those that remain in print form can be obtained by the library quickly. Documents in electronic form can be delivered directly to students' computers. Librarians and staff pursue service customized to individual students' needs, cultivating a small college atmosphere. The library's Web address is eastlib.east.asu.edu.

Computing Services

With more than 200 workstations in five classrooms and a Computing Commons, Information Technology at ASU

East provides general computing services, including e-mail and general purpose computing. The IT East department provides specialized software and systems to meet the particular needs of the ASU East programs. In addition, IT East provides mediated classrooms and audiovisual material to support e-learning initiatives. IT East has a staff of support personnel to aid the campus community's diverse computing needs, including Web development.

Williams Campus Union

The Campus Union is the center of the campus community, serving students, faculty, staff, and guests. Union facilities include meeting and study rooms, a ballroom, TV lounge, and a game room. Programs and services such as movie nights, ice cream socials, dances, and holiday parties complement the educational mission of the Williams Campus and enhance the quality of campus life. The union is staffed primarily by students, providing them the opportunity to develop leadership skills and a customer service orientation. For more information, call 480/727-1098.

Learning Center

In the Learning Center, undergraduate and graduate students can study, conduct research and access writing assistance, subject-area tutoring, and computer-assisted instruction. Staff members also provide workshops and in-class presentations on writing, presentation, and study skills. Located in the Academic Center Building, the Learning Center offers a convenient and quiet study location for individual students and study groups. Leisure reading is encouraged by offering recycled paperback books and magazines to borrow and comfortable furnishings in which to relax. All Learning Center services are free to enrolled students. For more information or to schedule a tutoring appointment, call 480/727-1452.

Recreational Facilities and Services

The Williams Campus Fitness Center is equipped with state-of-the-art weight training and cardiovascular machines, racquetball courts, and a gymnasium. Trained exercise professionals are on hand daily to provide personal training assistance. A variety of health, fitness, and sports classes are also offered at the Fitness Center. For students who prefer outdoor sports activities, the campus has basketball and tennis courts, soccer/football fields, baseball fields, a running track, and swimming pool. For more information, call 480/988-8400.

Student Health Services

Health services for ASU East students are provided by the Veteran's Administration Medical Center located at the Williams Campus. Services include primary assessment and treatment of health problems and injuries, physical examinations and immunizations, women's health care, diagnostic tests, laboratory tests/X-rays, and a pharmacy. Health education and counseling, smoking cessation counseling, and wellness and health assessments are also available. Student registration fees cover the cost of office visits for full-time ASU East students. Part-time students pay a nominal fee. Some office procedures and laboratory tests require additional charges. Health insurance is not required to use the health services; however, it is strongly advised for all students and is required for international students. For more information, call 602/222-6568.

Morrison School of Agribusiness and Resource Management

Raymond A. Marquardt, Dean

www.east.asu.edu/msabr

PURPOSE

The Morrison School of Agribusiness and Resource Management provides academic programs in Agribusiness and in Environmental Resources. Agribusiness is the business of food and fiber production and the technology necessary to change a raw material (a commodity) or an idea into a new product or business for the world's consumers. Producing, financing, marketing, and providing food and fiber for the world amounts to more than one-half of the earth's global economy.

Agribusiness courses in the Morrison School are designed to prepare students for a wide range of job opportunities in agribusiness and business. More than 20 percent of all jobs in the United States are agribusiness-related, and the industry is even more important internationally, with more than half of all jobs in developing countries related to food and fiber products. Population increases worldwide have led forecasters to predict that more than nine billion food and fiber consumers will be part of the global agribusiness system by the year 2050. Forecasts also estimate that, at that time, more than 20,000 agribusiness jobs will go unfilled due to a lack of skilled professionals.

The academic programs in Agribusiness are especially designed to meet the needs of the urban student who has little or no previous agriculture experience. An interest in plants, animals, or food can be the starting point for career development in agricultural industries or resource management. The undergraduate programs also provide the necessary training for students preparing to enter graduate degree programs.

The Morrison School is strategically positioned to offer some unique programs. The concentration in professional golf management provides a student with the opportunity to qualify for the Professional Golf Association certification program in addition to majoring in Agribusiness. Similarly, for individuals more interested in the development and management of golf and other turf facilities, the golf and facilities management concentration is well suited.

Food, its marketing and safety, is a paramount importance now and in the future. The Morrison School offers specific concentrations in both of these areas. Food and agribusiness marketing is one of the signature concentrations in the school. Food science and safety are emphases stressed in the food and agribusiness marketing concentration.

For students interested in natural resource management, the school offers a major in Environmental Resources. Environmental resources is a science that applies across the ecological continuum of wilderness areas and urban lands. Students learn not only about wildlands but also about urban habitats and how people's activities affect the regenerative ability of natural resources. The Environmental Resources

curriculum provides the opportunity to develop technological skills such as remote sensing of data from aircraft or satellites, computer-based Geographic Information Systems, and techniques for ecological restoration.

Graduates of the Environmental Resources programs have employment opportunities in environmental resource management, applied ecology, wildlife biology, soil and water conservation, and land reclamation in both private firms and government agencies.

NATIONAL FOOD AND AGRICULTURAL POLICY PROJECT

The National Food and Agricultural Policy Project (NFAPP) constructs a 10-year baseline forecast for the fruit and vegetable produce industry and specific commodities, responds to congressional inquiries concerning policies affecting the fruit and vegetable industry, and publishes a monthly newsletter highlighting research efforts. Areas of study include domestic and international promotion of fruits and vegetables, trade and the impact of trade agreements, and crop insurance and risk management. For more information, call the director at 480/727-1124.

DEGREES

See the "Morrison School of Agribusiness and Resource Management Baccalaureate Degrees and Majors" table, page 608. For graduate degrees, see the "Morrison School of Agribusiness and Resource Management Graduate Degrees and Majors" table, page 609.

The Morrison School of Agribusiness and Resource Management offers two B.S. degrees: Agribusiness and Environmental Resources. Students interested in the Agribusiness major may select from the following concentrations: agribusiness finance, food and agribusiness marketing, food science, general agribusiness, golf and facilities management, international agribusiness, management of agribusiness, professional golf management, resource management, e-commerce, and preveterinary medicine. The Environmental Resources major offers concentrations in ecology, watershed ecology, and wildlife habitat management.

For students holding an A.A.S. degree, the school offers the Bachelor of Applied Science degree with concentrations in consumer products technology, food retailing, and resource team specialist.

The school offers the M.S. degree in Agribusiness and the M.S. degree in Environmental Resources. Agribusiness students may select either a research-oriented program, which leads to the completion of a supervised thesis, or a program consisting of course work only (nonthesis option). All M.S. candidates in Agribusiness must complete a minimum of 36 semester hours. Students in the Environmental Resources

Morrison School of Agribusiness and Resource Management Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Agribusiness	B.S.	Agribusiness finance, e-commerce, food and agribusiness marketing, food science, general agribusiness, golf and facilities management, international agribusiness, management of agribusiness, preveterinary medicine, professional golf management, resource management	Morrison School of Agribusiness and Resource Management
Applied Science	B.A.S.	Consumer products technology, food retailing, resource team specialist	Morrison School of Agribusiness and Resource Management
Environmental Resources	B.S.	Ecology, watershed ecology, wildlife habitat management	Morrison School of Agribusiness and Resource Management

degree program may study natural resource management, Geographic Information System/remote sensing, and animal/plant ecology. All M.S. candidates in Environmental Resources must complete 30 semester hours of approved graduate work. See the *Graduate Catalog* for more information.

ADMISSION

The Morrison School of Agribusiness and Resource Management admits students to the B.S. degree programs who meet the undergraduate admission requirements of Arizona State University; see “Undergraduate Admission,” page 54. Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and 2.50 for nonresident applicants.

GRADUATION REQUIREMENTS

Agribusiness—B.S.

The completion of a minimum of 120 semester hours—including First-Year Composition, General Studies (“General Studies,” page 78), and the school and concentration requirements—leads to the B.S. degree. Note that all three General Studies awareness areas are required. An overall GPA of 2.00 is required for graduation and students must have completed a minimum of 45 semester hours of upper-division credit. Also see special graduation requirements under “Preveterinary Medicine,” page 611.

B.S. Agribusiness Prerequisite Courses

Students who select the concentrations in agribusiness finance, food and agribusiness marketing, food science, general agribusiness, golf and facilities management, international agribusiness, management of agribusiness, or professional golf management must complete the following courses, some of which can also be used to meet university General Studies requirements:

ACC 230 Uses of Accounting Information I.....	3
ACC 240 Uses of Accounting Information II.....	3
BIO 100 The Living World <i>SQ</i>	4
CHM 101 Introductory Chemistry <i>SQ</i> ¹	4
ECN 111 Macroeconomic Principles <i>SB</i> ²	3
ECN 112 Microeconomic Principles.....	3
ENG 301 Writing for the Professions <i>L</i>	3

MAT 210 Brief Calculus <i>MA</i>	3
Total.....	26

¹ This course is not required for the professional golf management concentration.

² This course is not required for the golf and facilities management concentration.

Core Requirements. Agribusiness employers require their employees to possess a greater range of skills and competencies than at any time in the past. Rapid changes in information technology and the increasingly competitive food production and distribution sector mean that agribusiness needs graduates adequately equipped to deal with the business applications of these changes. The agribusiness core, required of all the concentrations, is designed to prepare students with a core set of skills that these firms demand. The core consists of courses in business principles—management, marketing, and finance—as well as in the fundamentals of agribusiness operations management.

AGB 100 Introduction to Agribusiness.....	3
AGB 161 Computer Applications in Agribusiness.....	3
AGB 310 Agribusiness Management I.....	3
AGB 320 Agribusiness Marketing I.....	3
AGB 321 Agribusiness Marketing II*.....	3
AGB 332 Agribusiness Finance I.....	3
AGB 333 Agribusiness Finance II.....	3
AGB 360 Agribusiness Statistics <i>CS</i>	3
AGB 364 Agribusiness Technologies I*.....	3
AGB 365 Agribusiness Technologies II.....	3
AGB 410 Agribusiness Management II.....	3
AGB 414 Agribusiness Analysis <i>L</i>	3
Core total.....	36

* This course is not required for the professional golf management or golf and facilities management concentrations.

Concentrations

After completing the required agribusiness core, students select a concentration in their area of interest. A concentration allows a student to select a series of courses that complement the agribusiness core, supplement the student’s desire to master another area of interest, and broaden career opportunities.

Morrison School of Agribusiness and Resource Management Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Agribusiness	M.S.	Agribusiness management and marketing, food quality assurance	Morrison School of Agribusiness and Resource Management
Environmental Design and Planning*	Ph.D.	Design; history, theory and criticism; planning	Committee on Environmental Design and Planning
Environmental Resources	M.S.	GIS/remote sensing, natural resource management, and range ecology	Morrison School of Agribusiness and Resource Management

* Doctoral courses for these interdisciplinary programs administered by ASU Main are also offered at ASU East.

E-commerce Concentration. The extraordinary growth of e-commerce in the business and agribusiness venues provides significant opportunities for students prepared to work in this medium. A student following this concentration builds upon the prerequisite core and the agribusiness core to prepare for this field. The opportunities for personal development, advancement, and success are present domestically and internationally.

E-commerce

AGB 436 Entrepreneurship in Financial Management of E-Commerce.....	3
AGB 463 Electronic Commerce in Agribusiness.....	3
AGB electives	8
Agribusiness core	36
Agribusiness prerequisite courses.....	26
Website design course.....	3
Total	79

Agribusiness Finance Concentration. Agribusiness finance concentration graduates are expected to possess a broad knowledge of financial theory and practice as it pertains to the agribusiness sector. This will involve applying quantitative and computer-based analytical techniques to real-world agribusiness problems. Specific course content includes topics in financial management, financial markets, risk management, and the evaluation of financial assets and business alternatives.

Agribusiness Finance

AGB 334 Agricultural Commodities	3
AGB 431 Intermediate Agribusiness Financial Management.....	3
AGB 434 Agricultural Risk Management and Insurance	3
AGB electives	8
Agribusiness core	36
Agribusiness prerequisite courses.....	26
Total	79

Management of Agribusiness Concentration. Agribusiness managers encounter many problems and opportunities on a daily basis that are unique to the agribusiness sector. Students choosing this concentration develop skills in managing people, internal resources, and external relationships in an increasingly dynamic environment.

Management of Agribusiness

AGB 351 Management Science CS.....	3
AGB 380 Applied Microeconomics.....	3

AGB 411 Agricultural Cooperatives.....	3
or AGB 480 Agribusiness Policy and Government Regulations (3)	
AGB electives	8
Agribusiness core.....	36
Agribusiness prerequisite courses.....	26
Total	79

Food and Agribusiness Marketing Concentration. Students in the food and agribusiness marketing concentration develop critical skills relevant to dealing with firms involved in food, fiber, consumer products, and pharmaceutical manufacturing; distribution; and retailing. Students also learn about the relationship between input suppliers, commodity associations, and primary producers. To this end, food and agribusiness marketing students are required to complete a series of courses that analyze the behavior and performance of both commodity and consumer food markets.

Food and Agribusiness Marketing

AGB 334 Agricultural Commodities	3
or AGB 420 Food Marketing (3)	
AGB 422 Consumer Behavior	3
AGB 429 Marketing Research	3
AGB electives	8
Agribusiness core	36
Agribusiness prerequisite courses.....	26
Total	79

Food Science Concentration. The food science concentration focuses on both scientific and technical competency skills with an emphasis on food microbiology, food chemistry, biotechnology, mathematics, and statistics. This unique program prepares graduates for employment opportunities in the food, beverage, and dairy industries; regulatory agencies such as the FDA and USDA; international organizations such as FAO and WHO; and consumer organizations. In addition, graduates may choose to pursue advanced degrees.

Food Science

AGB 340 Food Processing	3
AGB 440 Food Safety	3
AGB 442 Food and Industrial Microbiology	4
AGB upper-division electives	7
Agribusiness core	36
Agribusiness prerequisite courses.....	26
Total	79

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Preveterinary Medicine. A student studying agribusiness could also be preparing for admission to a professional veterinary school. While completing the courses needed for acceptance into veterinary school, the student is broadening his or her career potential with agribusiness courses. The major reason for the lack of success as a professional veterinarian is rarely bad medicine or science. It is often a lack of knowledge of how to run a business or practice. In addition, should a preveterinary student decide not to apply to a veterinary school, this major provides alternative career paths into human or veterinary pharmaceutical industries or the food industry. Selection of this concentration permits students to complete the preveterinary requirements for entrance to professional veterinary school. The curriculum permits the student to obtain some course work in agribusiness as it relates to professional practice and industry.

Preveterinary Medicine

Agribusiness core	21
AGB 310 Agribusiness Management I (3)	
AGB 320 Agribusiness Marketing I (3)	
AGB 332 Agribusiness Finance (3)	
AGB 360 Agribusiness Statistics (3)	
AGB 364 Agribusiness Technologies I (3)	
AGB 365 Agribusiness Technologies II (3)	
AGB 414 Agribusiness Analysis (3)	
Preveterinary medicine prerequisites	54-58
Total	75-79

Veterinary College Acceptance. A student who has been accepted to a school of veterinary medicine before he or she has earned a B.S. degree in the Morrison School may do so by completing a minimum of 30 semester hours at ASU and the General Studies requirement. Students must receive a written statement from the dean of the Morrison School giving senior-in-absentia privileges. A student is eligible to receive the B.S. degree after the ASU Office of the Registrar receives a recommendation from the dean of the veterinary professional school and a transcript indicating the student has completed the necessary semester hours commensurate with ASU graduation requirements.

Veterinary Medical Schools. There are approximately 27 schools of veterinary medicine in the United States. Each school establishes the specific prerequisites that are required for admission. Advisors in the Morrison School assist students in designing their class schedules to meet the requirements of the veterinary schools to which they plan to apply. Each school generally looks for courses in biology, chemistry, genetics, microbiology, and organic chemistry. In addition to a science foundation, all students must meet the University General Studies requirement, complete 45 semester hours of upper-division courses, and satisfy the school requirements.

Resource Management Concentration. The resource management concentration combines the agribusiness con-



Maintaining fairways and greens is taught in the classroom and on the course.

Tim Trumble photo

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

centration core with solid technical preparation in biology, chemistry, and/or economics. There is a growing demand by industry and government for persons who understand both the technical and managerial basis for sustainable development, remediation and/or utilization of natural resources for agribusiness, conservation, and habitat restoration. Courses and field projects prepare the student to analyze, develop, and manage programs that make use of land and water in an economic as well as environmentally sustainable fashion.

Resource Management

AGB 455 Resource Management <i>SB</i>	3
AGB 480 Agribusiness Policy and Government Regulations	3
ETM 301 Environmental Management	3
Agribusiness core	36
Resource Management prerequisites	43–51
Total	88–96

Environmental Resources—B.S.

The primary emphasis of the Environmental Resources major is natural resource management and conservation. Particular attention is given to the study of ecosystem characteristics as they relate to the use of renewable resources. Students learn applications of ecological principles to resource management through examples drawn from forest, range, riparian, and urban ecosystems. The Environmental Resources major offers three concentrations: ecology, watershed ecology, and wildlife habitat management.

GRADUATION REQUIREMENTS

The completion of a minimum of 120 semester hours—including the First-Year Composition requirement, General Studies (“General Studies,” page 78), the Environmental Resources core, and selected concentration requirements—leads to the B.S. degree. An overall GPA of 2.00 and a minimum grade of “C” in the Environmental Resources core are required for graduation. Students must have completed a minimum of 45 semester hours of upper-division credit. Some of the Environmental Resources core courses may also be used to meet General Studies requirements.

Environmental Resources Core

BIO 181 General Biology <i>SQ</i>	4
BIO 182 General Biology <i>SG</i>	4
CHM 101 Introductory Chemistry <i>SQ</i>	4
CHM 231 Elementary Organic Chemistry <i>SQ*</i>	3
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ*</i>	1
ERS 130 Introduction to Environmental Science <i>SQ</i>	4
ERS 207 Plant Taxonomy	4
ERS 225 Soils	3
ERS 226 Soils Laboratory	1
ERS 246 Environmental Conservation and Ecology <i>G</i>	3
ERS 301 Ecology	3
ERS 350 Environmental Statistics <i>CS</i>	3
ERS 365 Watershed Management	3
ERS 402 Vegetation Measurement	4
ERS 480 Ecosystem Management and Planning <i>L</i>	3
ERS 485 GIS in Natural Resources	3
ERS 490 Recent Advances in Environmental Resources	1
MAT 210 Brief Calculus <i>MA</i>	3
Core total	54

* Both CHM 231 and 235 must be taken to secure *SQ* credit.

Ecology Concentration

The ecology concentration focuses on connections between basic ecological principles and their application to a broad array of environmental challenges across a wide range of ecosystems. Course work concentrates on the interrelationships of soil, water, and vegetation systems and the fauna that inhabit these systems. In addition to a strong foundation in these areas, students are provided with the analytical tools and skills to evaluate and apply ecological concepts to management issues. Potential employers of graduates in this field of study include federal resource management agencies, environmental protection agencies, departments of environmental quality, state land departments, and private environmental consulting firms.

This concentration is completed by taking the ERS core curriculum and 25 hours of courses listed below, with a minimum of 10 hours from each group.

Group A: Introduction and Backdrop to Ecology

ERS 307 Plant Identification	4
ERS 311 Applied Ecology	4
ERS 420 Ecological Restoration	3
ERS 425 Soil Classification and Management	3
ERS 433 Riparian Ecosystem Management	3
ERS 434 Wetland Ecosystems and Soils	3
ERS 460 Applied Systems Ecology	3
ETM 301 Environmental Management	3
GLG 101 Introduction to Geology I (Physical) <i>G, SQ*</i>	3
GLG 103 Introduction to Geology I—Laboratory <i>SQ*</i>	1
GPH 111 Introduction to Physical Geography <i>SQ</i>	4
GPH 210 Society and Environment <i>G</i>	3
PLB 308 Plant Physiology	4

Group B: Focus Areas and Tools of Ecology

ERS 364 Surface Water Hydrology	3
ERS 448 Soil Ecology	3
ERS 449 Landscape Ecology	3
ERS 474 Wildlife Ecology	3
ERS 475 Wildlife Management	4
ERS 477 Environmental Risk Assessment and Management	3
ERS 486 Remote Sensing in Environmental Resources	4
GPH 314 Global Change <i>G, HU</i>	3
GPH 381 Geography of Natural Resources <i>G</i>	3
GPH 418 Landforms of the Western United States <i>L</i>	3
GPH 481 Environmental Geography	3

* Both GLG 101 and 103 must be taken to secure *SQ* credit.

Additional courses must be approved by an advisor.

Watershed Ecology Concentration

The watershed ecology concentration underscores the importance of understanding and placing environmental processes and problems at the watershed or landscape level. Students completing this concentration have a solid background in physical and biological sciences. Upper-division course work focuses on providing the intellectual capability and tools to address water-related management issues. Graduates may pursue careers with federal and state agencies or in the private sector as resource managers, environmental health specialists, or consultants.

This concentration is completed by taking the ERS core curriculum and 25 hours of courses listed below, with a minimum of 10 hours from each group.

Group A: Introduction and Backdrop to Watershed Ecology

CHM 302 Environmental Chemistry	3
ERS 307 Plant Identification	4

ERS 311 Applied Ecology	4
ERS 333 Water Resources Management.....	3
ERS 364 Surface Water Hydrology.....	3
ERS 425 Soil Classification and Management.....	3
ERS 460 Applied Systems Ecology	3
ERS 465 Surface Water Quality	3
ETM 302 Water and Wastewater Treatment Technology	3
GLG 101 Introduction to Geology I (Physical) <i>SQ</i>	3
GLG 103 Introduction to Geology I—Laboratory <i>SQ</i>	1
GPH 212 Introduction to Meteorology <i>SG*</i>	3
GPH 214 Introduction to Meteorology Laboratory <i>SG*</i>	1

Group B: Focus Areas and Tools of Watershed Ecology

ERS 420 Ecological Restoration.....	3
ERS 433 Riparian Ecosystem Management.....	3
ERS 477 Environmental Risk Assessment and Management	3
ERS 486 Remote Sensing in Environmental Resources	4

* Both GPH 212 and 214 must be taken to secure SG credit.
Additional courses must be approved by an advisor.

Wildlife Habitat Management Concentration

The wildlife habitat management concentration focuses on the connection between wildlife ecology and habitat management. The student completing this concentration gains a solid background in wildlife biology, coupled with a strong understanding of the physical and biological elements of vegetation ecology. Upper-division course work provides those necessary tools to meet the challenges of maintaining a balance between biological diversity and social pressures on the wildland resources. Potential employers of graduates from this field of study include the U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, Department of Defense, state wildlife management departments, and private environmental consulting firms.

This option is completed by taking the ERS core curriculum and 25 hours of courses listed below, with a minimum of 10 hours from each group.

Group A: Introduction and Backdrop to Wildlife Habitat Management

BIO 331 Animal Behavior.....	3
BIO 340 General Genetics.....	4
BIO 360 Animal Physiology.....	4
BIO 370 Vertebrate Zoology.....	4
BIO 385 Comparative Invertebrate Zoology	4
BIO 426 Limnology <i>L</i>	4
BIO 471 Ornithology	3
BIO 472 Mammalogy	4
BIO 474 Herpetology.....	3

Group B: Focus Areas and Tools of Wildlife Habitat Management

ERS 307 Plant Identification.....	4
ERS 311 Applied Ecology	4
ERS 353 Wildlife Nutrition.....	3
ERS 420 Ecological Restoration.....	3
ERS 433 Riparian Ecosystem Management.....	3
ERS 434 Wetland Ecosystems and Soils.....	3
ERS 460 Applied Systems Ecology	3
ERS 474 Wildlife Ecology	4
ERS 475 Wildlife Management	3
ERS 486 Remote Sensing in Environmental Resources	4

Additional courses must be approved by an advisor.

Environmental Resources Minor

A minor in Environmental Resources is available to students who are interested in environmental courses but who wish to pursue other majors. A minimum of 27 semester hours of course work is required with 15 semester hours of upper-division courses in environmental resources. A grade of “C” or higher is required for all courses taken for the minor. Independent study and special topics courses may not be used to satisfy the minimum course requirements.

Required courses

BIO 181 General Biology <i>SQ</i>	4
BIO 182 General Biology <i>SG</i>	4
ERS 225 Soils	3
ERS 226 Soils Laboratory.....	1
ERS 301 Ecology	3
Additional upper division ERS courses	12
Total	27

Applied Science—B.A.S.

The Bachelor of Applied Science degree is a capstone degree for the Associate of Applied Science degree. The B.A.S. degree exposes students to advanced concepts and diverse critical thinking skills to prepare them for future career opportunities and professional advancement.

Admission

Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and 2.50 for nonresident applicants.

B.A.S Degree Graduation Requirements. The B.A.S. degree program consists of 60 semester hours of upper-division courses, with 30 hours in residence. An overall GPA of 2.00 or higher is required.

A.A.S. degree transfer.....	60
Assignable credit.....	6
B.A.S. core.....	16
Concentration.....	19
General Studies	19
Total	120

General Studies Curriculum

The B.A.S. curriculum builds on the general education content of the A.A.S. degree. Additional General Studies courses are taken in the core or concentration. General Studies courses focus on contextual learning.

L.....	3
MA.....	3
HU.....	3
HU or SB	3
SB.....	3
SG	4
Total	19

Assignable Credit

Assignable credit allows space in the curriculum for prerequisite courses. The courses are determined by the student and advisor.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

B.A.S. Core

AGB 310 Agribusiness Management I	3
AGB 320 Agribusiness Marketing I.....	3
AGB 360 Agribusiness Statistics CS.....	3
AGB 414 Agribusiness Analysis L.....	3
AGB 460 Agribusiness Management Systems	4
Total	16

Consumer Products Technology Concentration. Students studying consumer products technology prepare for a career in the food and consumer products industries. Students learn to develop food, drug, cosmetic, and other consumer products and to ensure product safety and marketability by obtaining a thorough mastery of courses in product and package design, manufacturing, processing, and safety.

Consumer Products Technology

AGB 340 Food Processing	3
AGB 364 Agribusiness Technologies I.....	3
AGB 440 Food Safety	3
AGB 490 Recent Advances in Agribusiness	1
MET 341 Manufacturing Analysis	3
MET 494 ST: Consumer Manufacturing.....	3
MET 494 ST: Packaging Design.....	3
Total	19

Food Retailing Concentration. A student studying food retailing prepares for a career in the food marketing and distribution industries. Potential employers are food manufacturing and processing companies, distribution centers, wholesalers, and all types of food retailers, e.g., supermarkets, mass merchandisers, fast food outlets, restaurants, and direct marketers of food.

Food Retailing

AGB 330 Agribusiness Accounting	3
AGB 332 Agribusiness Finance I.....	3
AGB 340 Food Processing	3
AGB 420 Food Marketing.....	3
AGB 440 Food Safety	3
AGB 445 Food Retailing.....	3
AGB 484 Internship	1
Total	19

Resource Team Specialist Concentration. The resource team specialist concentration combines the technical preparation acquired in an A.A.S. program with a special orientation in environmental and resource management. This concentration prepares individuals to participate as an integral part of an environmental emergency response team as well as postemergency biological and environmental rehabilitation efforts.

Resource Team Specialist

AGB 332 Agribusiness Finance I.....	3
AGB 456 World Agricultural Resources G.....	3
AGB 457 Resource Policy and Sustainability.....	3
AGB 458 Bioremediation.....	3
AGB 484 Internship	1
ETM 301 Environmental Management.....	3
ETM 303 Environmental Regulations.....	3
Total	19

Morrison School of Agribusiness and Resource Management

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www.east.asu.edu/msabr

PROFESSORS

BRADY, BROCK, DANEKE, EDWARDS, KAGAN,
MARQUARDT, SEPERICH, SHULTZ, THOR

ASSOCIATE PROFESSOR

GREEN, MILLER, RACCACH, RICHARDS, WHYSONG

ASSISTANT PROFESSORS

BURKINK, MANFREDO, PATTERSON,
SCHMITZ, STANTON

AGRIBUSINESS (AGB)**AGB 100 Introduction to Agribusiness. (3)**

fall

Overview of agribusiness industries and career opportunities.

AGB 105 Global Resources. (3)

fall and spring

Effect of quality, quantity, and cost of national food supplies on technology, marketing, and world agricultural policies.

AGB 161 Computer Applications for Agribusiness Industries. (3)

spring

Use and integration of word processing, spreadsheets, and databases as tools for managing an agribusiness firm. Lecture, lab.

General Studies: CS

AGB 171 Animal Science. (3)

spring

Comparative growth, development, and propagation of domestic animals.

AGB 191 First-Year Seminar. (1-3)

not regularly offered

AGB 194 Special Topics. (1-4)

not regularly offered

AGB 210 Livestock Management. (3)

fall and spring

Methods of managing livestock enterprises, economics, loss prevention, and marketing.

AGB 211 Crop Management. (3)

fall and spring

Crop production, management principles, and their application to crop growth and development.

AGB 250 World Food Dynamics. (3)

spring

Transition and development of raw agricultural commodities into nutritional food products. Emphasis given to food expansion in developing countries.

General Studies: G

AGB 251 Cultural Diversity in Agribusiness. (3)

spring

Promotes the awareness and appreciation of cultural diversity within the U.S. through the study of cultural and social contributions in agribusiness of women and minorities.

AGB 258 International Agribusiness. (3)

fall

Identification and analysis of methods, problems, and future of international agribusiness operations. Emphasizes special problems associated with international agribusiness systems.

General Studies: G

AGB 266 Golf Course Irrigation. (3)*fall and spring*

Design, management, and maintenance of golf course irrigation systems. Lecture, lab.

AGB 271 Veterinary Medicine Today. (3)*spring*

Introduction to the role of the veterinarian as related to the fields of food supply and veterinary medicine.

AGB 294 Special Topics. (1–4)*not regularly offered***AGB 310 Agribusiness Management I. (3)***fall*

Principles of management, including planning, organizing, integrating, measuring, and developing people in agribusiness organizations.

AGB 311 Establishing an Agribusiness. (3)*fall*

Opportunities and problems associated with new firm development in agribusiness. Business plan is written and presented orally.

AGB 320 Agribusiness Marketing I. (3)*fall and spring*

Examines marketing strategy, focusing on the marketing mix (product, price, promotion, and place) in a dynamic socioeconomic environment. Prerequisites: ACC 230, 240; AGB 360; ECN 112.

AGB 321 Agribusiness Marketing II. (3)*fall and spring*

Examines the food marketing system with emphasis on the marketing institutions, arrangements, and methods for basic commodities. Prerequisites: ACC 230, 240; AGB 360; ECN 112.

AGB 330 Agribusiness Accounting. (3)*fall*

Introduction to managerial accounting for agribusiness using computerized accounting systems.

AGB 332 Agribusiness Finance I. (3)*fall and spring*

Introduction to concepts in agribusiness financial management: time value of money, risk and return, capital budgeting, and cost of capital. Prerequisites: ECN 111 and 112 (or their equivalents); introductory accounting.

AGB 333 Agribusiness Finance II. (3)*spring*

Introduction to financial markets and institutions. Interest rate determination, money and banking, equity markets, farm credit system, vendor financing. Prerequisites: ECN 111 and 112 (or their equivalents); introductory accounting.

AGB 334 Agricultural Commodities. (3)*fall*

Trading on futures markets. Emphasis on the hedging practices with grains and meats. Prerequisite: AGB 320.

AGB 340 Food Processing. (3)*fall*

Introduction to processed food quality assurance, statistical sampling, and inspection procedures. Prerequisite: AGB 364.

AGB 341 Food Analysis. (3)*not regularly offered*

Processing control and scientific instrumentation used in food quality assurance laboratories. Prerequisites: AGB 364; CHM 101.

AGB 351 Management Science. (3)*fall*

Focus on the construction, solution, and interpretation of quantitative models used for management decision making in agribusiness firms. Prerequisites: AGB 320, 360; ECN 112; MAT 117.

*General Studies: CS***AGB 355 Sustainable Agriculture Systems. (3)***fall and spring*

Innovative developments in precision farming, irrigation, soils, tillage methods, machinery, and biotechnology in crop production. Prerequisite: AGB 211.

AGB 360 Agribusiness Statistics. (3)*fall and spring*

Statistical methods with applications in agribusiness and resource management. Lecture, computer lab. Prerequisite: college algebra.

*General Studies: CS***AGB 364 Agribusiness Technologies I. (3)***fall*

Examination of methods of managing diverse crop and livestock enterprises with emphasis on growth, development, marketing, and loss prevention. Prerequisite: BIO 100.

AGB 365 Agribusiness Technologies II. (3)*fall*

Biotechnology and other methods used in the production, processing, and distribution of food. Prerequisite: BIO 100.

AGB 366 Golf Turf Management. (2)*fall and spring*

Selection, establishment, and maintenance of turf grasses bred specifically for golf greens, fairways, and roughs. Lecture, lab.

AGB 367 Golf Course Landscape Plants and Design. (3)*fall and spring*

Identification, culture, and use of plants in a golf course setting. Cross-listed as PLB 363. Credit is allowed for only AGB 367 or PLB 363. Fee.

AGB 370 Wildlife and Domestic Animal Nutrition. (3)*spring*

Survey of nutritional needs of domestic and wild animals. Prerequisites: AGB 210, 211; General Studies SQ course.

AGB 371 Animal Genetics. (3)*fall*

Principles of animal genetics, including heritable traits, chromosomal aberrations, population genetics, molecular genetics, and gene regulation. Prerequisites: BIO 181, 182.

AGB 380 Applied Microeconomics. (3)*fall and spring*

Emphasis on application of the theory of the firm, theory of exchange, and consumer theory.

AGB 394 Special Topics. (1–4)*not regularly offered***AGB 410 Agribusiness Management II. (3)***spring*

Principles of human resource management in agribusiness firms. Prerequisite: AGB 310.

AGB 411 Agricultural Cooperatives. (3)*spring*

Organization, operation, and management of agricultural cooperatives.

AGB 414 Agribusiness Analysis. (3)*fall and spring*

Analysis of agribusiness firm decisions in the ecological, economic, social, and political environments. Special emphasis on ethical issues surrounding food production and consumption.

*General Studies: L***AGB 420 Food Marketing. (3)***spring*

Food processing, packaging, distribution, market research, new food research and development, and social implications. Prerequisite: AGB 320.

AGB 422 Consumer Behavior. (3)*fall*

Application of behavioral concepts in analyzing consumer food purchases and their implications for marketing strategies. Prerequisite: completion of Agribusiness core (or its equivalent).

AGB 424 Sales and Merchandising in Agribusiness. (3)*summer*

Principles and techniques of selling and merchandising in the agricultural and food industries.

AGB 425 Agricultural Marketing Channels. (3)*fall*

Operational stages of agricultural commodities in normal distribution systems and implementation of marketing strategies. Prerequisite: AGB 320.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

AGB 429 Marketing Research. (3)*fall*

Examines the marketing research process and its role in facilitating agribusiness decisions. Emphasizes problem identification, survey design, and data analysis. Prerequisite: completion of Agribusiness core (or its equivalent).

AGB 431 Intermediate Agribusiness Financial Management. (3)*spring*

Comprehensive treatment of topics in financial management of agribusiness: capital structure, dividend policy, asset valuation, mergers and acquisitions, risk management. Prerequisites: AGB 332, 333.

AGB 433 Intermediate Agribusiness Financial Markets. (3)*spring*

Role and function of agribusiness in U.S. financial system. Topics include rural banking, farm credit system, monetary policy, and federal reserve. Prerequisite: completion of Agribusiness core (or its equivalent).

AGB 434 Agricultural Risk Management and Insurance. (3)*fall*

Strategies to manage agricultural price and business risk: derivatives, insurance, self-insurance, and public policy. Prerequisite: completion of Agribusiness core (or its equivalent).

AGB 436 Entrepreneurship and Financial Management of E-Commerce. (3)*fall*

Uses lectures, case studies, and business plans to highlight challenges of starting and running a small business. Lecture, seminar, case studies, computer labs.

AGB 440 Food Safety. (3)*spring*

Control, prevention, and prediction of microbial and chemical food-borne diseases. Prerequisite: AGB 442 or instructor approval.

AGB 441 Food Chemistry. (3)*spring*

Biochemical and chemical interactions that occur in raw and processed foods. Prerequisites: CHM 115, 231.

AGB 442 Food and Industrial Microbiology. (4)*not regularly offered*

Food- and industrial-related microorganisms; deterioration and preservation of industrial commodities. Lecture, lab. Prerequisite: microbiology course with lecture and lab.

AGB 443 Food and Industrial Fermentations. (3)*spring*

Management, manipulation, and metabolic activities of industrial microbial cultures and their processes. Prerequisite: AGB 442 or instructor approval.

AGB 445 Food Retailing. (3)*fall*

Food retail management. Discusses trends, problems, and functions of food retail managers within various retail institutions. Lecture, case studies.

AGB 450 International Agricultural Development. (3)*fall*

Transition of developing countries from subsistence to modern agriculture. Emphasis placed on implications for U.S. agribusiness working abroad.

*General Studies: G***AGB 452 International Agricultural Policy. (3)***fall*

Use of international trade theory to analyze the effects of government policies, trade agreements, and exchange rates on agribusiness. Prerequisite: ECN 112.

AGB 454 International Trade. (3)*spring*

International practices in trading of agribusiness, technology, and resource products and services.

AGB 455 Resource Management. (3)*spring*

Explores differences between societal and individual valuations of natural resources and considers public policy versus market-based solutions to environmental concerns. Prerequisite: ECN 112.

*General Studies: SB***AGB 456 World Agricultural Resources. (3)***fall*

World production and consumption of agricultural products, international relationships, and agencies concerned with world agricultural development problems.

*General Studies: G***AGB 457 Resource Policy and Sustainability. (3)***fall*

Considers the evolution of policy design, focusing on how resource and environmental concerns have affected agricultural development and trade policies. Prerequisite: ECN 112.

AGB 458 Bioremediation. (3)*spring*

Technical-regulatory and policy issues emanating from minetailing and animal waste. Lecture, case studies.

AGB 460 Agribusiness Management Systems. (4)*spring*

Development and use of decision support systems for agribusiness management and marketing. Lecture, lab.

AGB 463 Electronic Commerce Applications. (3)*fall*

Overview of electronic commerce technology with introduction to basics of design, control, operation, organization, and emerging issues. Pre- or corequisite: AGB 460 (or its equivalent).

AGB 466 Integrated Pest Control. (2)*fall and spring*

Management of pests affecting golf turf and landscape plants. Structural Pest Control Board sprayer certification preparation offered during the semester. Lecture, lab.

AGB 470 Comparative Nutrition. (3)*not regularly offered*

Effects of nutrition on animal systems and metabolic functions. Prerequisite: CHM 231.

AGB 471 Diseases of Domestic Animals. (3)*spring*

Discussion of animal welfare, mechanisms of disease development, causes and classification of diseases, disease resistance, and common zoonoses. Prerequisite: BIO 181.

AGB 473 Animal Physiology I. (3)*not regularly offered*

Control and function of the nervous, muscular, cardiovascular, respiratory, and renal systems of domestic animals. Prerequisites: BIO 181; CHM 113.

AGB 479 Veterinary Practices. (3)*fall and spring*

Observation of and participation in veterinary medicine and surgery supervised by local veterinarians. Prerequisite: advanced preveterinary student.

AGB 480 Agribusiness Policy and Government Regulations. (3)*spring*

Development and implementation of government food, drug, pesticide, and farm policies and regulations that affect the management of agribusiness.

AGB 484 Internship. (1–12)*fall and spring***AGB 490 Recent Advances in Agribusiness. (1)***fall and spring*

Reports and discussions of current topics and problems associated with agribusiness. May be repeated for credit.

AGB 492 Honors Directed Study. (1–6)*not regularly offered*

Possible topics:

(a) Recent Advances in Food Science. (1)

AGB 493 Honors Thesis. (1–6)*not regularly offered***AGB 494 Special Topics. (1–4)***not regularly offered***AGB 498 Pro-Seminar. (1–7)***not regularly offered***AGB 499 Individualized Instruction. (1–3)***not regularly offered***AGB 500 Research Methods. (1–12)***not regularly offered*

AGB 501 Master's Thesis Preparation. (1)*fall and spring*

Step-by-step guidelines to major elements of a master's thesis along with practical guidelines for conducting research.

AGB 510 Advanced Agribusiness Management I. (3)*fall*

Managing and financing agribusiness, emphasizing environmental and economic sustainability in a global economy undergoing radical change. Prerequisite: AGB 310.

AGB 511 Advanced Agribusiness Management II. (3)*spring*

Analysis of organization behavior, change, and resource requirements within agribusiness systems. Prerequisite: AGB 310.

AGB 512 Food Industry Management. (3)*spring*

Operations and management of food-processing factories, food distribution centers, and retail food-handling firms.

AGB 513 Advanced Cooperatives. (3)*fall*

Advanced study of cooperatives and other nongovernmental organizations (NGO) focusing on management and proposal preparation for international agencies.

AGB 514 Advanced Agribusiness Analysis I. (3)*spring*

Vertical integration and differentiation in food and agricultural industries. Prerequisite: AGB 510 or 528.

AGB 515 Agribusiness Coordination. (3)*spring*

Organizational alternatives for agribusiness with emphasis on cooperatives and trading companies. Prerequisite: AGB 510 or 528.

AGB 528 Advanced Agribusiness Marketing. (3)*fall*

Theory and analysis of marketing farm commodities, risks, and the effect of future trading on cash prices.

AGB 529 Advanced Agribusiness Marketing Channels. (3)*spring*

Analysis of agribusiness market channel systems. Formulation of marketing strategies.

AGB 532 Advanced Agribusiness Finance. (3)*fall*

Financial management of agribusiness firms; agribusiness financial analysis, investment analysis, agricultural risk management, and introduction to agricultural financial intermediaries. Prerequisites: both computer literacy and 1 finance course or only instructor approval.

AGB 535 Commodity Analysis. (3)*fall*

Analysis of commodity markets.

AGB 536 Small Business Finance, Entrepreneurship, and E-Commerce. (3)*fall*

Uses lectures, case studies, and business plans to highlight challenges of starting and running a small business. Lecture, seminar, case studies, computer labs.

AGB 540 Advanced Food Science. (3)*not regularly offered*

Chemical and physical nature of processed foods. Emphasis on food product development.

AGB 550 International Agricultural Development. (3)*fall*

Transition of developing countries from subsistence to modern agriculture. Emphasis placed on implications for U.S. agribusiness working abroad.

AGB 551 Agribusiness in Developing Countries. (3)*spring*

Factors influencing successful development of agribusiness enterprises in developing countries, including poverty, access to capital and technology, and trade opportunities.

AGB 552 International Agricultural Policy. (3)*fall*

Use of international trade theory to analyze the effects of government policies, trade agreements, and exchange rates on agribusiness.

AGB 554 Advanced International Trade. (3)*fall*

Advanced international practices in trading of agribusiness, technology, and resource products and services.

AGB 557 Resource Policy and Sustainability. (3)*fall*

Considers the evolution of policy design, focusing on how resource and environmental concerns have affected agricultural development and trade policies.

AGB 558 Advanced Bioremediation. (3)*spring*

Management and policy issues related to bioremediation of minetailing and animal waste and replacement of chemical control with biological methods. Lecture, case studies.

AGB 560 Advanced Agribusiness Management Systems. (3)*not regularly offered*

Development and use of decision support systems for agribusiness management decision making. Prerequisite: AGB 510.

AGB 561 Agribusiness Research Methods. (3)*fall*

Use of model building, hypothesis testing, and empirical analysis in solving agribusiness problems.

AGB 570 Managerial Economics for Agribusiness. (3)*fall*

Concepts in micro- and macroeconomics applied to agribusiness management environments: price formation, market structure, information economics, fiscal and monetary policy. Prerequisites: introductory micro- and macroeconomics.

AGB 580 Practicum. (1–12)*not regularly offered***AGB 581 Advanced Agribusiness Policy. (3)***fall*

Policy-making history, structure, and process.

AGB 583 Field Work. (1–12)*not regularly offered***AGB 584 Internship. (1–12)***not regularly offered***AGB 587 Resource Policy and Sustainability. (3)***fall*

Considers the evolution of policy design, focusing on how resource and environmental concerns have affected agricultural development and trade policies.

AGB 590 Reading and Conference. (1–12)*not regularly offered***AGB 591 Seminar. (1–12)***not regularly offered***AGB 592 Research. (1–12)***not regularly offered***AGB 593 Applied Project. (1–12)***not regularly offered***AGB 594 Conference and Workshop. (1–12)***not regularly offered***AGB 595 Continuing Registration. (1)***not regularly offered***AGB 598 Special Topics. (1–4)***not regularly offered***AGB 599 Thesis. (1–12)***not regularly offered***AGB 600 Research Methods. (1–12)***not regularly offered***AGB 690 Reading and Conference. (1–12)***not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

ENVIRONMENTAL RESOURCES (ERS)

ERS 130 Introduction to Environmental Science. (4)

fall

Introduction to soil resources, their physical and chemical properties, classification, energy dynamics, and the role they play in environmental quality. Lecture, lab.

General Studies: SQ

ERS 191 First-Year Seminar. (1–3)

not regularly offered

ERS 207 Applied Plant Taxonomy. (2)

fall

Introduction to identification of vascular plants. Survey of plant families. Field trips required. 2 hours lecture. Prerequisite: BIO 182. Corequisite: ERS 208.

ERS 208 Applied Plant Taxonomy Laboratory. (2)

fall

Techniques and practices in vascular plant identification. Lab. Prerequisite: BIO 182. Corequisite: ERS 207.

ERS 225 Soils. (3)

fall

Fundamental properties of soils and their relation to plant growth and the nutrition of man and animals. Relation of soils to environmental quality. Prerequisite: CHM 101 or 113 (or its equivalent).

ERS 226 Soils Laboratory. (1)

fall

Selected exercises to broaden the background and understanding of basic soil principles. Lab. Corequisite: ERS 225.

ERS 246 Environmental Conservation and Ecology. (3)

spring

Principles of environmental conservation from global, historical, and ecological perspectives. Consideration of development/sustainability issues.

General Studies: G

ERS 294 Special Topics. (1–4)

not regularly offered

ERS 301 Ecology. (3)

fall

Introduction to the principles of ecology emphasizing vegetation community ecology. Field trips required. Prerequisite: BIO 182.

ERS 307 Plant Identification. (4)

fall

Identification of key plants of western rangelands and forests. Laboratory emphasis on grass identification. Lecture, lab. Prerequisite: ERS 207 or PLB 310 (or its equivalent).

ERS 311 Applied Ecology. (4)

spring

Ecological principles and their implication for management of ecosystems. 3 hours lecture, 1 hour lab. Prerequisites: ERS 225, 301, 350.

ERS 333 Water Resources Management. (3)

not regularly offered

Sources, their development, and conservation in arid regions for agricultural, natural resources, and urban uses. Prerequisite: CHM 101 or 113.

ERS 350 Environmental Statistics. (3)

fall

Statistical methods with applications in natural resource management and the environmental sciences. Use of computers and the internet. Prerequisites: CSE 180; MAT 117.

General Studies: CS

ERS 353 Wildlife Nutrition. (3)

not regularly offered

Principles of nutrient metabolism in wildlife species, with emphasis on understanding the interaction of wildlife with their environment. Prerequisites: a combination of BIO 181 and 182 and CHM 101 or only instructor approval.

ERS 360 Range Ecosystem Management. (3)

fall

Ecosystem management principles applied to rangelands. Herbivory as an ecological process, evaluation of rangeland health, multiple use of rangelands. Lecture, recitation. Prerequisites: BIO 320 (or its equivalent); ERS 246.

ERS 364 Surface Water Hydrology. (3)

fall in even years

Hydrologic principles in an ecological context. Discharge measurements, open channel hydraulics, bed forms, sediment transport as applied to ecological problems. Lecture, lab, field trip. Prerequisite: ERS 350.

ERS 365 Watershed Management. (3)

not regularly offered

Hydrologic, physical, biological, and ecological principles applied to watershed management. Impact of ecosystem manipulations on water yield and quality. 1 weekend field trip. Prerequisites: ERS 225, 246.

ERS 402 Vegetation Measurement. (4)

spring

Vegetation sampling and inventory as related to animal-habitat relations. Lecture, lab, 1 weekend field trip. Prerequisites: a combination of ERS 301 and 307 and 350 and program major or only instructor approval.

ERS 415 Wildlife Life Histories. (4)

spring

Life histories of the major mammal, reptile/amphibian, and avian species found in the Southwest, with emphasis on management. Lecture, lab. Prerequisites: BIO 370 (or 385); ERS 360.

ERS 420 Ecological Restoration. (3)

spring

Techniques of ecological restoration applied for the improvement of arid and semiarid land and sensitive habitats. Weekend field trips. Prerequisite: ERS 360.

ERS 425 Soil Classification and Management. (3)

not regularly offered

Principles of soil genesis, morphology, and classification. Presents management and conservation practices. Prerequisite: ERS 225.

ERS 433 Riparian Ecosystem Management. (3)

not regularly offered

Examines the functions and components that make up riparian ecosystems and the management of these ecosystems. Lecture, field trip. Prerequisite: ERS 225 or instructor approval.

ERS 434 Wetland Ecosystems and Soils. (3)

not regularly offered

Wetland ecosystems structure and function including hydrology and biogeochemistry with special emphasis on soils. Lecture, weekend field trip. Prerequisite: ERS 225 or instructor approval.

ERS 448 Soil Ecology. (3)

not regularly offered

Soils viewed in an ecosystem context, soil-plant relationships, nutrient budgets, and abiotic factors that influence soil processes. Prerequisites: a combination of BIO 320 and ERS 225 and 226 or only instructor approval.

ERS 449 Landscape Ecology. (3)

not regularly offered

Causes and ecological consequences of spatial and temporal patterns in the environment. Prerequisite: ERS 301.

ERS 460 Applied Systems Ecology. (3)

not regularly offered

Systems approach applied to analysis and management of natural resource ecosystems. Use of simulation models. 2 hours lecture, 3 hours lab. Prerequisites: ERS 350 (or its equivalent); 1 course in ecology.

ERS 465 Surface Water Quality. (3)

spring in odd years

Examines factors that impact water quality. Surface water sampling and analysis with interpretation for wildlife, humans, and other users. Prerequisites: ERS 364, 365.

ERS 474 Wildlife Ecology. (3)

not regularly offered

Integrates ecological concepts as applied to wildlife populations and their interaction with the habitat and other species. Lecture, lab, 1 weekend field trip. Prerequisite: ERS 360.

ERS 475 Wildlife Management. (4)

spring

Principles and techniques of applied ecology for the management of wildlife populations. Lecture, lab. Prerequisites: ERS 311 and 474 (or their equivalents).

ERS 477 Environmental Risk Assessment and Management. (3)
not regularly offered
 Survey of methods related to identification, evaluation, comparison, and management of environmental risks. Prerequisite: senior standing.

ERS 480 Ecosystem Management and Planning. (3)
spring
 Planning for management and conservation of wildland ecosystems. Ecological, economic, and social constraints on long-term sustainable resource development. Computer tools for resource planning. Lecture, 1 weekend field trip. Prerequisites: ERS 402 (or its equivalent); senior standing.

General Studies: L
ERS 484 Internship. (1–12)
not regularly offered

ERS 485 GIS in Natural Resources. (3)
fall
 Principles of Geographic Information Systems (GIS) utilized in natural resource management. Use of computers for spatial analysis of natural resources. Lecture, lab. Prerequisite: CSE 180 (or its equivalent).

ERS 486 Remote Sensing in Environmental Resources. (4)
spring
 Principles and application of remote sensing technologies in natural resource management. Integration of computerized data from aerial photography and LanSat imagery in resource management. Lecture, lab. Prerequisite: ERS 485 (or its equivalent).

ERS 489 Undergraduate Research. (1–3)
fall and spring
 Undergraduate research under the supervision of an environmental resources faculty member. Prerequisite: junior or senior status.

ERS 490 Recent Advances in Environmental Resources. (1)
fall and spring
 Current literature and significant developments involving environmental resources. May be repeated for credit.

ERS 492 Honors Directed Study. (1–6)
not regularly offered

ERS 493 Honors Thesis. (1–6)
not regularly offered

ERS 494 Special Topics. (1–4)
not regularly offered

ERS 498 Pro-Seminar. (1–7)
not regularly offered

ERS 499 Individualized Instruction. (1–3)
not regularly offered

ERS 500 Research Methods. (1–12)
not regularly offered

ERS 533 Riparian Ecology. (3)
not regularly offered
 Review of recent literature, developments, and methods related to riparian ecology. Applications of soil and landscape ecology to riparian systems. Lecture, discussion, field trips.

ERS 540 Plant Responses to Environmental Stresses. (3)
not regularly offered
 Reaction of plants to environmental stresses; aerial pollutants, fire, herbivores, mechanical treatments, pesticides, and soil amendments. 1 weekend field trip. Prerequisite: ERS 360 or instructor approval.

ERS 550 Vegetation Dynamics. (4)
fall
 Dynamics of vegetation emphasizing ecological succession, applications of landscape ecology and GIS, and analysis of vegetation data. Field trips, studio. Prerequisite: introductory statistics course.

ERS 551 Advanced Environmental Statistics. (4)
spring
 Advanced statistical procedures for environmental resources. Techniques for analyzing research data that do not meet assumptions. Studio. Prerequisite: ERS 350 (or its equivalent).

ERS 553 Advanced Animal Nutrition. (4)
not regularly offered
 Metabolic and physiological interactions of nutrients in wild and domesticated animals consuming natural feeds. Lecture, lab.

ERS 560 Systems Ecology. (3)
not regularly offered
 Quantitative description and mathematical modeling of ecosystem structure and function. Techniques for model construction and simulation. Lecture, lab. Prerequisites: ERS 350 (or its equivalent); computer programming; 6 hours in ecological studies.

ERS 561 Spatial Statistics and GIS. (3)
fall
 Dependent spatial data, analysis and description, semivariograms, variograms, kriging, and GIS analysis. Lecture, lab. Prerequisites: ERS 350 and 485 (or their equivalents).

ERS 580 Practicum. (1–12)
not regularly offered

ERS 584 Internship. (1–12)
not regularly offered

ERS 585 Spatial Modeling with GIS. (3)
fall
 GIS technology for spatial modeling of natural resources. Practical application of GIS technology for problem solving. Lecture, lab. Prerequisite: ERS 485 (or its equivalent) or instructor approval.

ERS 590 Reading and Conference. (1–12)
not regularly offered

ERS 591 Environmental Resources Seminar. (1–12)
not regularly offered

ERS 592 Research. (1–12)
not regularly offered

ERS 593 Applied Project. (1–12)
not regularly offered

ERS 594 Conference and Workshop. (1–12)
not regularly offered

ERS 595 Continuing Registration. (1)
not regularly offered

ERS 598 Special Topics. (1–4)
not regularly offered

ERS 599 Thesis. (1–12)
not regularly offered

ERS 691 Seminar. (1–12)
not regularly offered

East College

David E. Schwalm, Dean

www.east.asu.edu/ecollege

PURPOSE

East College was created by the Arizona Board of Regents in February 1997 to serve four purposes:

1. to offer an array of upper-division General Studies and general interest courses for students enrolled in ASU East degree programs;
2. to coordinate the Partnership in Baccalaureate Education with Chandler-Gilbert Community College through which ASU East students are provided with lower-division General Studies and major prerequisite courses;
3. to offer an academic home for students who choose the unique environment of ASU East but do not wish to declare a major immediately; and
4. to develop new degree programs for ASU East.

General Studies/General Interest. Each semester, East College offers a selection of popular upper-division ASU General Studies and general interest courses, primarily for support of ASU East students but open to all ASU students who might find the time or location convenient. East College typically offers courses in anthropology, art, communication, economics, English, history, mathematics, music, philosophy, political science, psychology, religious studies, sociology, and women's studies. Students should refer to the current *Schedule of Classes* for specific courses offered at ASU East each semester. All credit earned at ASU East automatically transfers to ASU Main or ASU West.

East College also offers support courses for the Bachelor of Applied Science (B.A.S.) degree. The applied science core (ASC) courses are upper-division courses specifically designed to build upon the mathematics and science base acquired in the Associate of Applied Science (A.A.S.) degree.

APPLIED SCIENCE CORE (ASC)

ASC 301 Contextual Uses of Algebra in Technology. (1)

fall and spring

Uses algebra to solve real-world technological problems using currently available computer software. Prerequisite: B.A.S. major.

ASC 302 Contextual Uses of Geometry in Technology. (1)

fall and spring

Uses geometrical concepts to solve real-world technological problems using currently available computer software. Prerequisite: B.A.S. major.

ASC 303 Contextual Uses of Trigonometry in Technology. (1)

fall and spring

Uses trigonometry to solve real-world technological problems using currently available computer software. Prerequisite: B.A.S. major.

ASC 315 Numeracy in Technology. (3)

fall and spring

Contextual uses of mathematics in applied sciences. Emphasizes using mathematical methodologies to solve technology-related problems. Prerequisite: B.A.S. major.

ASC 325 Physical Sciences in Technology. (4)

fall and spring

Physical systems and their interrelationships on technology systems. Real-world applications of physical systems. Lecture, lab. Prerequisite: B.A.S. major.

Partnership in Baccalaureate Education. Through the partnership with Chandler-Gilbert Community College, ASU East students take first-year composition courses and courses that meet lower-division ASU General Studies requirements listed in the "General Studies," page 78. These courses are available in an innovative integrated first-year curriculum designed to foster academic success. Students can also take major prerequisite courses, introductory language courses, and other lower-division courses of general interest through the partnership.

East College/No Preference Majors. Students who would like to start their college careers at ASU East to benefit from the unique campus environment can declare "East College/No Preference" as an interim major while completing the General Studies requirements and searching for an ASU major that serves their personal and career objectives. East College provides advising for No Preference majors.

DEGREE PROGRAMS

See the "East College Baccalaureate Degrees and Majors" table, page 621. For graduate degrees, see the "East College Graduate Degrees and Majors" table, page 622.

East College also offers certificate programs in Multimedia Writing and Technical Communication; minors in Food and Nutrition Management and Human Nutrition; and a concentration for the B.A.S. See the *Graduate Catalog* for more information about graduate programs.

OTHER NEW PROGRAMS

East College has been authorized to plan a B.S. degree in Human Health, which is currently under development. For more information, access the East College Web site at www.east.asu.edu/ecollege.

INTERDISCIPLINARY STUDIES—B.I.S.

The Bachelor of Interdisciplinary Studies (B.I.S.) is a university-wide program intended for the student who has academic interests that might not be satisfied with existing majors. Building on two academic concentrations and an interdisciplinary core, students in the B.I.S. are expected to take an active role in creating their educational plan and defining their career goals. The B.I.S. emphasizes written communication, versatility, and critical thinking, skills desired in a changing workplace environment. Self-assessment, and appraisal of opportunities to support academic and career goals are key elements in the core courses. The concentrations are generally based on approved academic minors, certificate programs, or special coherent clusters of

East College Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Applied Psychology	B.S.	—	East College
Applied Science	B.A.S.	Multimedia writing and technical communication	East College
Business Administration	B.S.	—	East College
Elementary Education	B.A.E.	—	East College
Exercise and Wellness	B.S.	—	East College
Interdisciplinary Studies	B.I.S.	See “B.I.S. Concentrations” table, page 109.	Bachelor of Interdisciplinary Studies Advisory Committee
Multimedia Writing and Technical Communication	B.S.	—	East College
Nutrition	B.S.	Dietetics, food and nutrition management, human nutrition	Department of Nutrition

course work. The student should be able to integrate these into a meaningful program.

The combination of areas of concentration gives students flexibility in creating unique programs to accomplish individual academic goals. Students who declare the B.I.S. as their major in East College at ASU East take their core courses and at least one concentration through ASU East. The second concentration may be taken at ASU Main, ASU West, or ASU East. The B.I.S. core courses are offered by East College. Concentrations at ASU East are offered by East College, the College of Technology and Applied Sciences, and the Morrison School of Agribusiness and Resource Management. Students interested in the B.I.S. should arrange an appointment with an East College advisor at 480/727-1515 before declaring the B.I.S. major.

Basic Requirements

The B.I.S. requires 120 semester hours. The major is composed of a 12 hour core and a minimum of 36 hours in two concentrations (18 hours each). Throughout the core sequence, the student assembles a portfolio including self-assessment of progress toward career goals and an evaluation of key educational and personal activities that may apply. The core courses must be taken in sequence. These courses may not be transferred from other institutions. BIS 302 and 401 may be taken concurrently. All core courses must be completed with a grade of “C” or higher.

Core Courses

BIS 301 Foundations of Interdisciplinary Studies <i>L</i>	3
BIS 302 Interdisciplinary Principles	3
BIS 401 Applied Interdisciplinary Studies	3
BIS 402 Senior Seminar <i>L</i>	3
Total	12

For course descriptions, see “Bachelor of Interdisciplinary Studies,” page 111.

Other Requirements

In addition to the basic requirements, students must complete all university requirements, including First-Year Composition and General Studies. Early advising is recommended to ensure that students meet requirements efficiently and optimize their choices.

Declaring the B.I.S. Major. Students must receive approval from an East College advisor before declaring the B.I.S. major. In addition, the following requirements must be met:

1. 45 semester hours of college credit completed;
2. cumulative GPA of 2.00 for continuing ASU students or in-state transfer students (2.50 for out of state transfers); and
3. selection of two concentrations with a minimum of two courses in each (minimum grade of “C”) completed or one completed and one in progress (i.e., after the drop/add period) in each area.

Approved Concentrations

Each concentration requires 18 semester hours, with each course completed with a grade of “C” or higher. Twelve of the hours must be in upper-division courses. Students should check for new information about concentrations on the Web at www.east.asu.edu/ecollege or contact an East College advisor at 480/727-1515.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

East College Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Curriculum and Instruction*	Ph.D.	Exercise and wellness education	Interdisciplinary Committee on Curriculum and Instruction
Exercise and Wellness	M.S.	—	East College
Nutrition	M.S.	—	Department of Nutrition

* Doctoral courses for this interdisciplinary program administered by ASU Main are offered at ASU East.

Faculty of Applied Psychology

Roger W. Schvaneveldt
Faculty Head
(CNTR 78) 480/727-1066

APPLIED PSYCHOLOGY—B.S.

This major offers a traditional psychology core leading to graduate school preparation and/or to applications in human factors with emphasis on human-computer interaction, aviation, or manufacturing. Although most careers in psychology require graduate training, there are some employment opportunities for B.S. students in applied settings. For example, there is a need for individuals who can help deal with problems of usability of products and systems. The Applied Psychology program offers courses and experiences to prepare students for these positions. The rigor of the major also provides strong preparation for further graduate study in psychology. The program serves students in other ASU East programs such as engineering technologies, aeronautical management technology, information management technology, and business administration.

Graduation Requirements

The completion of 120 semester hours—including First-Year Composition, General Studies (see “General Studies,” page 78), and major requirements—leads to the B.S. degree. The major allows for at least 24 semester hours of electives. The major requirements for the B.S. degree in Applied Psychology consist of a 25-hour core of psychology courses, 12 hours in applied psychology, and 18 hours of related course work.

Core Courses (25 hours). Core courses provide a general background in the basic scientific areas of psychology and provide a culminating experience to integrate the varied studies.

PGS 101 Introduction to Psychology <i>SB</i>	3
PGS 350 Social Psychology <i>SB</i>	3
PSY 230 Introduction to Statistics <i>CS</i>	3
PSY 290 Research Methods <i>L/SG</i>	4
PSY 323 Sensation and Perception	3
PSY 324 Memory and Cognition	3
PSY 325 Physiological Psychology	3
PSY 477 Applied Psychology Capstone Experience*	3
or HON 493 Honors Thesis (3)	—
Total	25

* This PSY course is offered only by ASU East.

Applied Psychology Courses (12 hours). Students work with an advisor to select courses in Applied Psychology emphasizing human-computer interaction (HCI), aviation, training, manufacturing, or methods. Course work must include a minimum of four of the following courses:

AMT 410 Aviation Safety and Human Factors	3
PGS 471 Psychological Testing	3
PSY 320 Learning and Motivation.....	3
PSY 330 Statistical Methods <i>CS</i>	3
PSY 360 Cognitive Science*	3
PSY 390 Experimental Psychology <i>L</i>	3
PSY 437 Human Factors <i>L</i>	3
PSY 438 Human-Computer Interaction*	3
PSY 439 Training and Skill Acquisition*	3
PSY 440 Industrial/Organizational Psychology*.....	3
PSY 494 Special Topics	1–4

* This PSY course is offered only by ASU East.

Sample 12-hour Course Sets

Human-Computer Interaction

PSY 437 Human Factors
PSY 438 Human-Computer Interaction
PSY 440 Industrial/Organizational Psychology
PSY 494 Special Topics

Aviation

PSY 437 Human Factors
PSY 438 Human-Computer Interaction
PSY 440 Industrial/Organizational Psychology
AMT 410 Aviation Safety and Human Factors

Manufacturing

PSY 437 Human Factors
PSY 438 Human-Computer Interaction
PSY 439 Training and Skill Acquisition
PSY 440 Industrial/Organizational Psychology

Training

PSY 320 Learning and Motivation
PSY 437 Human Factors
PSY 439 Training and Skill Acquisition
PSY 440 Industrial/Organizational Psychology

Methods

PSY 330 Statistical Methods
PSY 360 Cognitive Science
PSY 390 Experimental Psychology
PGS 471 Psychological Testing

Related Course Work

BIO 120 Human Physiology <i>SG</i>	4
or BIO 181 General Biology (4)	
or BIO 193 The Nature of Biological Science <i>SQ</i> (4)	
or BIO 201 Human Anatomy and Physiology I <i>SG</i> (4)	
MAT 210 Brief Calculus.....	3
A computer programming course	3
Courses selected in consultation with an advisor	8
Total	18

For more information about program requirements and courses, call an East College advisor at 480/727-1515, send e-mail to east.college@asu.edu, or access the Web site at www.east.asu.edu/ecollege/appliedpsych.

For PGS courses and additional PSY courses, see “Department of Psychology,” page 437.

PSYCHOLOGY (PSY)

For more PSY courses, see “Department of Psychology” under “College of Liberal Arts and Sciences.”

E PSY 360 Cognitive Science. (3)

once a year

Examines cognition from the varied perspectives of philosophy, linguistics, psychology, computer science (artificial intelligence), and neuroscience. Lecture, discussion. Prerequisite: PSY 324.

E PSY 438 Human-Computer Interaction. (3)

once a year

Theories, methods, and findings concerning the usability of computer systems and the design of effective user interfaces. Lecture, discussion, projects. Prerequisite: PSY 437.

E PSY 439 Training and Skill Acquisition. (3)

once a year

Theories, methods, and findings concerning the acquisition of skilled performance and the design of effective training systems. Lecture, discussion, projects. Prerequisite: PSY 437.

E PSY 440 Industrial/Organizational Psychology. (3)

once a year

Examines personnel selection, performance assessment, job and workplace design, job satisfaction, organizational behavior, management systems, and industrial safety. Lecture, discussion, projects. Prerequisite: PSY 230 (or an equivalent statistics course).

E PSY 477 Applied Psychology Capstone Experience. (3)

once a year

Applied psychology from a systems perspective. Requires a report based on research and/or applied work as a culminating experience. Lecture, discussion, projects. Prerequisite: senior standing.

Faculty of Business Administration

Roger W. Hutt
Faculty Head
 (CNTR 76) 480/727-1055

BUSINESS ADMINISTRATION—B.S.

The B.S. degree in Business Administration offers a survey of contemporary business disciplines and additional depth in at least three disciplines. The curriculum enables students to gain essential business competencies, knowledge of business disciplines and methods, and appreciation for contemporary business environments and cultures. Students prepare for careers in business, industry, or government, as well as for career advancement and entrepreneurial enterprises. This program operates under the umbrella of the ASU Main College of Business AACSB accreditation, but it is offered through East College. Students seeking admission to the professional program must have completed 56 semester hours in good standing, including 30 hours of skill courses (see “Business Core Requirements,” page 154). The major requires an additional 33 hours, including a 15-hour

core, seven hours of professional proficiency courses, and 11 hours of business advanced electives. Students may choose to take additional business courses, related courses in industry-specific business programs at ASU East (e.g. agribusiness, information and management technology, and aeronautical management technology), or a special optional 12-hour extension of the basic major in industry-specific programs.

For the latest information about application, admissions, program requirements, and courses, call an East College advisor at 480/727-1515, or access the Web site at www.east.asu.edu/ecollege/businessadmin.

Faculty of Elementary Education

Bette S. Bergeron
Faculty Head
 (CNTR 82) 480/727-1303

PROFESSOR

BERGERON

LECTURER

WENHART

ELEMENTARY EDUCATION—B.A.E.

Program Overview

The Elementary Education program at ASU East is unique in its focus on intensive field experiences, practical application of current theory, and emphasis on technology. The newly revised curriculum is also focused on and directly aligned with Arizona’s standards for teachers. Courses are arranged sequentially and taken with peer cohorts in four semester-long blocks. Elementary Education students are immersed in field experiences each semester that directly link with course discussions and assignments. Course instructors have taught in a variety of K–8 settings and can therefore augment class experiences with practical applications. Current educational technologies are incorporated into course delivery and assignments. Additionally, students have the opportunity to choose between the Elementary Education program at the ASU East campus or participate in one of the campus’s district-based school partnerships.

Program Requirements

A total of 120 semester hours is required for graduation with a minimum of 45 semester hours of upper-division credit. As part of the undergraduate degree program, students will complete ASU General Studies (see “General Studies” section, page 78) requirements. In addition, Elementary Education students are required to complete 18 semester hours in an academic specialization, which is tailored to an individual student’s academic strengths (e.g., math, science, social studies, English). The remaining program hours, which specifically focus on the teaching

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

profession, are outlined below. Students must first be admitted to the ASU East Elementary Education program before enrolling in the Professional Preparation Program courses (Blocks I–IV).

Foundations (15 semester hours)*

EDC 314	The Developing Child.....	3
EDP 310	Educational Psychology <i>SB</i>	3
MCE 446	Understanding the Culturally Diverse Child <i>C</i>	3
MTE 180	Theory of Elementary Mathematics.....	3
SPE 311	Orientation to Education of Exceptional Children <i>SB</i> ...	3

* For foundation course descriptions see “College of Education,” page 188.

Professional Preparation Program*

Block I (11–12 hours)

EDC 320	Integrated Learning Experience I: Learning Climate....	2
EDC 330	Literacy I: Emerging Literacy and Phonemic Awareness.....	3
EDC 340	Schooling and Social Context	3
EDC 350	Educational Technology I: Applications	1
EDC 351	Educational Technology II: Instruction and Evaluation.....	1
EDC 352	Educational Technology III: Design.....	1
EDC 474	Field Experience.....	0–1

Block II (11–12 hours)

EDC 325	Integrated Learning Experience II: Instructional Design and Implementation.....	2
EDC 335	Literacy II: Intermediate Literacy and Phonetic Principles.....	3
EDC 345	Math Methods for the Elementary Classroom	3
EDC 355	Accommodating Instruction for Diverse Learners.....	3
EDC 474	Field Experience.....	0–1

Block III (11–12 hours)

EDC 420	Integrated Learning Experience III: Assessment.....	2
EDC 430	Literacy III: Interventions.....	3
EDC 440	Science Methods for the Elementary Classroom	3
EDC 450	Social Studies Methods for the Elementary Classroom.....	3
EDC 474	Field Experience.....	0–1

Block IV (12–14 hours)

EDC 425	Integrated Learning Experience IV: Professional Knowledge.....	2
EDC 484	Student Teaching in the Elementary School.....	10–12

* Block courses can only be taken upon admission to the Elementary Education program.

Postbaccalaureate Program. Individuals who hold a bachelor’s degree from an accredited institution are encouraged to participate in the Elementary Education program as non-degree graduate students. Postbaccalaureate students complete the same professional preparation program courses as outlined above, which are augmented by the students’ unique life and work experiences.

For more information, visit CNTR 82, or call 480/727-1303.

Application. Applications for the ASU East Elementary Education programs are due October 15 for spring admission, and May 15 for fall admission. Students eligible for admission must meet the following criteria:

1. admission to ASU East;
2. a minimum cumulative GPA of 2.50;

3. completion of at least 56 semester hours at the time of admission (undergraduate degree-seeking students); or, completion of a bachelor’s degree from an accredited institution (postbaccalaureate students);
4. evidence of competence in written English.

Applications include two letters of recommendation and a résumé outlining work with school-age children and/or their families. Students should call the ASU East Teacher Education Office at 480/727-1103 for complete admission packet information and eligibility requirements.

State Certification. Students who successfully complete the undergraduate or postbaccalaureate routes to Elementary Education teacher preparation at ASU East are recommended for K–8 certification in the State of Arizona pending the completion of all other requirements mandated by the state. These additional requirements include, but are not limited to, successful completion of all appropriate areas of the Arizona Teacher Proficiency Assessment and course work in the United States and Arizona constitutions. Because of the possibility that requirements for state certification may change, students are urged to maintain close contact with their education advisor.

Advising Information. It is important for all students to work closely with an ASU East academic advisor to ensure that their overall curriculum is coherent and best reflects their unique academic talents. For the latest information about application, admissions, program requirements, and courses, access the Web site at www.east.asu.edu/ecollege/elementaryed, or call the ASU East Teacher Education Office at 480/727-1103.

ELEMENTARY EDUCATION (EDC)

EDC 320 Integrated Learning Experience I: Learning Climate. (2)
fall and spring

Exploration of factors contributing to a positive and productive classroom learning environment. Interactive forum.

EDC 325 Integrated Learning Experience II: Instructional Design and Implementation. (2)
fall and spring

Design and implementation of developmentally appropriate instruction, and the alignment of instruction with district and state academic standards. Interactive forum. Prerequisite: EDC 320.

EDC 330 Literacy I: Emerging Literacy and Phonemic Awareness. (3)
fall and spring

Development of language from birth to age 8, and appropriate strategies for promoting growth in speaking, listening, reading, and writing. Applied inquiry. Corequisite: EDC 474.

EDC 335 Literacy II: Intermediate Literacy and Phonetic Principles. (3)
fall and spring

Strategies for teaching literacy in intermediate elementary classrooms, the application of phonetic principles to instruction, and integrating literacy across disciplines. Applied inquiry. Prerequisite: EDC 330. Corequisite: EDC 474. Pre- or corequisite: EDC 325.

EDC 340 Schooling and Social Context. (3)
fall and spring

Seminar addressing foundational issues in education, including the culture of schooling, current social contexts, and educational law. Interactive forum.

General Studies: L

EDC 345 Math Methods for the Elementary Classroom. (3)

fall and spring

Developmentally appropriate practices for teaching and assessing mathematics in grades K–8. Applied inquiry. Prerequisite: MTE 180. Corequisite: EDC 474. Pre- or corequisite: EDC 325.

EDC 350 Educational Technology I: Applications. (1)

fall and spring

Module focused on basic technological skills needed for managing classroom instruction. Lab.

EDC 351 Educational Technology II: Instruction and Evaluation. (1)

fall and spring

Module focused on technology as an instructional medium, evaluation, and effective classroom use. Lab. Prerequisite: EDC 350.

EDC 352 Educational Technology III: Design. (1)

fall and spring

Module focused on instructional design utilizing a variety of technologies, including multimedia. Lab. Prerequisite: EDC 351.

EDC 355 Accommodating Instruction for Diverse Learners. (3)

fall and spring

Identifying and accommodating learners with special needs, including classroom adaptations in instruction and assessment. Forum, practicum. Prerequisite: SPE 311. Corequisite: EDC 474. Pre- or corequisite: EDC 325.

EDC 420 Integrated Learning Experience III: Assessment. (2)

fall and spring

Principles related to classroom assessment, including the alignment of assessment to curriculum, test interpretation, and a variety of assessment techniques. Interactive forum. Prerequisite: EDC 325.

EDC 425 Integrated Learning Experience IV: Professional Knowledge. (2)

fall and spring

Exploration of issues related to professional knowledge, including interdisciplinary instruction and the impact of the community on students' learning. Interactive forum. Prerequisite: EDC 420. Corequisite: EDC 484.

EDC 430 Literacy III: Interventions. (3)

fall and spring

Strategies for accommodating students struggling with learning, with a focus on the areas of literacy acquisition and assessment. Forum, practicum. Prerequisites: EDC 335, 355. Corequisite: EDC 474. Pre- or corequisite: EDC 420.

EDC 440 Science Methods for the Elementary Classroom. (3)

fall and spring

Developmentally appropriate practices for teaching and assessing sciences in grades K–8. Applied inquiry. Prerequisites: EDC 325, 345. Corequisite: EDC 474. Pre- or corequisite: EDC 420.

EDC 450 Social Studies Methods for the Elementary Classroom. (3)

fall and spring

Developmentally appropriate practices for teaching and assessing social studies in grades K–8. Applied inquiry. Prerequisites: EDC 325, 335. Corequisite: EDC 474. Pre- or corequisite: EDC 420.

EDC 474 Field Experience. (0–1)

fall and spring

Application of course content in a K–8 school. Emphasis on observation, classroom management, planning and delivery of instruction, and assessment. Practicum. Corequisite: all methods courses in the teacher preparation program must be taken with Field Experience.

EDC 484 Student Teaching in the Elementary School. (10–12)

fall and spring

Supervised teaching in the area of specialization. Capstone internship in curriculum, instruction, and classroom management. Internship. Prerequisites: 2.50 GPA; completion of professional course sequence; approval of ASU East teacher preparation office. Corequisite: EDC 425.

Department of Exercise and Wellness

William J. Stone

Chair

mattingl@asu.edu

PROFESSORS

CORBIN, STONE

ASSOCIATE PROFESSOR

SWAN

ASSISTANT PROFESSOR

PHILLIPS

LECTURERS

JONES, WOODRUFF

EXERCISE AND WELLNESS—B.S.

The B.S. degree in Exercise and Wellness consists of 66 semester hours, including 21 semester hours of required EXW core courses.

The required core courses are as follows:

Required courses

EXW 300 Foundations of Exercise and Wellness <i>SB, L</i>	3
EXW 310 Computer Skills and Technology for Exercise and Wellness	3
EXW 342 Health Behavior Change	3
EXW 450 Cultural/Social Issues in Exercise and Wellness.....	3
EXW 484 EXW Internship	6
NTR 241 Human Nutrition	3
Total	21

Each EXW core course has specific prerequisite courses that must be taken before taking the respective core course. These prerequisite courses include the following:

BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
BIO 202 Human Anatomy and Physiology II.....	4
CHM 101 Introductory Chemistry <i>SQ</i>	4
or any equivalent chemistry	
COM 225 Public Speaking <i>L</i>	3
PGS 101 Introduction to Psychology <i>SB</i>	3
Total	18

All prerequisite and EXW courses must be completed with a minimum grade of “C.” Additional requirements for the major are described below.

EXW 212 Instructional Competency Laboratory	6
EXW 315 Physiological Foundations of Movement	3
EXW 320 Program Development and Leadership.....	3
EXW 330 Kinesiological Foundations of Movement.....	3
EXW 400 Stress Management for Wellness	3
EXW 420 Exercise Testing	3
EXW 425 Exercise Prescription	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Elective*.....	3
Total	27

* Three semester hours must be selected from an approved list of concentration electives.

EXERCISE AND WELLNESS MINOR

The minor in Wellness Foundations consists of the following plus all prerequisite courses:

EXW 300 Foundations of Exercise and Wellness.....	3
EXW 325 Fitness for Life.....	3
EXW 342 Health Behavior Change.....	3
EXW 450 Cultural Social Issues in Exercise and Wellness.....	3
EXW elective*	6
Total	18

* Six semester hours must be selected from an approved list of EXW electives. See an advisor for a list of approved electives.

GRADUATE PROGRAMS

The faculty in the Department of Exercise and Wellness offer programs leading to the M.S. degree in Exercise and Wellness. The department also participates with the Graduate College and College of Education in the program leading to the Ph.D. degree in Curriculum and Instruction with a concentration in Exercise and Wellness. See the *Graduate Catalog* for requirements.

EXERCISE AND WELLNESS (EXW)

EXW Note 1. A \$5.00 towel and locker fee is required each semester by students using towel and locker facilities for physical activity courses.

EXW Note 2. Physical activity instruction courses (EXW 105, 205, 305) may not be taken for audit. Excessive absences and/or tardiness are considered disruptive behavior.

EXW 100 Introduction to Health and Wellness. (3)

fall, spring, summer

Current concepts in health, exercise, and wellness. Emphasis placed on personal health, theories, attitudes, beliefs, and behaviors. Cross-listed as EPE 100/HES 100. Credit is allowed only for EPE 100 or EXW 100 or HES 100.

General Studies: SB

EXW 105 Physical Activity Instruction: Beginning. (1)

fall and spring

Beginning instruction in a variety of physical activities such as aerobics, aquatics, racquet sports, physical conditioning, and golf. "Y" grade only. May be repeated for credit. 3 hours per week. Activity. Fee. See EXW Notes 1, 2.

EXW 205 Physical Activity Instruction: Intermediate. (1)

fall and spring

Intermediate-level instruction in a variety of physical activities. Continuation of EXW 105. "Y" grade only. May be repeated for credit. 3 hours per week. Activity. Fee. See EXW Notes 1, 2.

EXW 212 Instructional Competency Laboratory. (2)

fall and spring

Methods of instructing and leading fitness activities including aerobic, resistance, and flexibility activities. May be repeated for credit. Lab. See EXW Note 1. Prerequisite: Exercise and Wellness major.

EXW 215 Physical Activity and Healthy Lifestyles. (1)

fall and spring

Applies principles of physical activity to personal fitness testing and program planning for people of all ages. Telecampus course. Not open to Exercise and Wellness majors or to students who have credit for EXW 325.

EXW 280 Global Issues in Exercise and Wellness. (3)

fall and spring

Historical overview of health promotion and wellness models as they relate to minority, gender, social, cultural, economic, international, and environmental issues.

EXW 300 Foundations of Exercise and Wellness. (3)

fall and spring

Analysis of research in various disciplines which contribute to health promotion and wellness.

General Studies: L/SB

EXW 301 Concepts of Fitness and Wellness. (1)

fall and spring

Guidelines for achieving health benefits of physical activity and other healthy lifestyles. Telecampus course. Not open to Exercise and Wellness majors or to students who have credit for EXW 325.

EXW 305 Physical Activity Instruction: Advanced. (1)

fall and spring

Advanced-level instruction in a variety of physical activities. Continuation of EXW 105. May be repeated for credit. "Y" grade only. 3 hours per week. Activity. Fee. See EXW Notes 1, 2.

EXW 310 Computer Skills and Technology for Exercise and Wellness. (3)

fall and spring

Use of computers to statistically analyze data and design presentations of findings. Design of health promotion educational applications and presentations. Lecture, lab. Prerequisite: MAT 117.

EXW 315 Physiological Foundations of Movement. (3)

fall and spring

Studies human movement with emphasis on physiological function of the body in response to physical activity and fitness training. Lecture, lab. Fee. Prerequisites: BIO 201, 202.

EXW 320 Program Development and Leadership. (3)

fall and spring

Principles of planning, organizing, promoting, and leading fitness and wellness programs. Prerequisites: COM 225; Exercise and Wellness major.

EXW 325 Fitness for Life. (3)

fall and spring

Physical fitness and benefits of exercise with emphasis on self-evaluation and personalized program planning for a lifetime. Not open to Exercise and Wellness majors or to students who have credit for EXW 215 or 301.

EXW 330 Kinesiological Foundations of Movement. (3)

fall and spring

Study and consideration of human movement with emphasis on kinesiology principles and their application to movement and fitness. Lecture, lab. Prerequisites: BIO 201, 202.

EXW 342 Health Behavior Change. (3)

fall and spring

Examines major theories of health behavioral change. Develops intervention strategies and techniques employed to facilitate health behavioral change. Prerequisite: PGS 101.

EXW 380 Body Image and Wellness. (3)

fall and spring

Explores body image in American culture from physical, psychological, historical, and societal perspectives. Prerequisites: NTR 241; PGS 101.

EXW 400 Stress Management for Wellness. (3)

fall and spring

Examines the stress response and management from a behavioral perspective as it pertains to individuals or groups. Prerequisite: PGS 101.

EXW 420 Exercise Testing. (3)

fall and spring

Theoretical basis and practical application of pre-exercise screening, exercise testing, estimates of energy expenditure, and interpretation of results. Lecture, lab. Fee. Prerequisites: EXW 315; current CPR certification.

EXW 425 Exercise Prescription. (3)

fall and spring

Theoretical bases for and application of general principles of exercise prescription to various ages, fitness levels, and health states. Prerequisites: EXW 320, 330. Pre- or corequisite: EXW 420.

EXW 442 Physical Activity in Health and Disease. (3)

fall and spring

Examines the role of physical activity and fitness in the development of morbidity and mortality throughout the human life span. Prerequisite: EXW 315.

General Studies: L

EXW 450 Cultural and Social Issues in Exercise and Wellness. (3)

fall and spring

Examines contemporary cultural and social issues in physical activity. Focus on theories of social behavior, racial, ethnic, and cultural differences. Prerequisite: PGS 101.

EXW 484 Exercise and Wellness Internship. (6)

fall, spring, summer

Supervised practicum experience in approved exercise and wellness/health promotion agencies. Field work. Prerequisites: EXW 310, 320, 420. Pre- or corequisite: EXW 425.

EXW 500 Research Methods. (3)

fall

Introduction to the basic aspects of research, including problem selection, literature review, instrumentation, data handling, methodology, and writing the report.

EXW 501 Research Statistics. (3)

spring

Statistical procedures; sampling techniques, hypothesis testing, and experimental designs as they relate to research publications.

EXW 505 Applied Exercise and Wellness Laboratory Techniques. (3)

spring

Investigative techniques used in the applied exercise testing/prescription laboratory. Emphasis on cardiorespiratory assessment, energy balance, body composition, and electrocardiography. Lecture, lab. Fee.

EXW 534 Sports and Fitness Conditioning. (3)

fall

Bases of sports and fitness conditioning, including aerobic and anaerobic power, strength, flexibility, and analysis of conditioning components for sports and fitness.

EXW 536 Physiological Aspects of Physical Activity and Chronic Disease. (3)

fall

Role of physiological mechanisms associated with acute and long-term physical activity and its influence on chronic disease and wellness.

EXW 542 Health Promotion. (3)

spring

Theory and research concerning fitness and wellness programs in nutrition, physical activity, smoking cessation, and stress management.

EXW 544 Fitness/Wellness Management. (3)

spring

Development of the fitness/wellness industry. Planning, organizing, promoting, and managing fitness/wellness programs.

EXW 575 Teaching Lifetime Fitness. (3)

spring

Organizing and implementing physical fitness programs in the schools with emphasis on individual problem solving.

EXW 599 Thesis. (1–12)

not regularly offered

EXW 642 Exercise Epidemiology. (3)

spring

Physical activity, exercise, and physical fitness and the development of chronic disease.

Faculty of Multimedia Writing and Technical Communication

Barry M. Maid
Faculty Head
(CNTR 80) 480/727-1190

PROFESSOR
MAID

ASSOCIATE PROFESSOR
BARCHILON

MULTIMEDIA WRITING AND TECHNICAL COMMUNICATION—B.S.

In the Multimedia Writing and Technical Communication program, students learn how to produce, to design, and to manage information using both traditional and developing technologies.

Students learn

1. to communicate, both orally and in writing, across audiences and cultures;
2. issues of ethics in technical communications;
3. awareness of the global nature of technical communication—both culturally and economically;
4. the ability to evaluate print, oral, and electronic sources;
5. understanding of appropriate technical genres;
6. the ability to demonstrate technical editing skills in all work;
7. the ability to incorporate appropriate visual elements and design in written documents and oral presentations; and
8. the ability to work in appropriate media.

The program serves students who wish to pursue careers as technical writers, technical editors, Web page and intranet page designers, multimedia designers, and desktop publishers, publications managers, and information designers.

GRADUATION REQUIREMENTS

To graduate with a B.S. degree in Multimedia Writing and Technical Communication, students must complete a minimum of 120 semester hours, including university graduation requirements and requirements of the major.

Multimedia Writing and Technical Communication Core

TWC 301 General Principles of Multimedia Writing.....	3
TWC 401 Principles of Technical Communication	3
TWC 411 Principles of Visual Communication	3
TWC 421 Principles of Writing with Technology	3
TWC 431 Principles of Technical Editing	3
TWC 490 Capstone.....	3
Total	18

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

Related Area (12 hours). Students select a related area consisting of 12 semester hours of study in one other discipline. At least nine of these 12 hours must be in the upper division. Suggested disciplines might be, but are not limited to, applied psychology, business administration, or computer graphics. Students, with the help of an advisor, may also develop a coherent interdisciplinary related area.

Electives (15 hours). The remaining hours will be electives in the major (TWC) at least six of which need to be in genre courses, such as TWC 443 Proposal Writing or TWC 447 Business Reports. An Internship (TWC 484) or supervised work experience is strongly recommended.

For information about program requirements and courses, access the Web at www.east.asu.edu/ecollege, or call an East College advisor at 480/727-1515.

BACHELOR OF APPLIED SCIENCE DEGREE

A Bachelor of Applied Science is also offered with a concentration in multimedia writing and technical communication. The B.A.S. degree is a “capstone” degree for the Associate of Applied Science degree. The B.A.S. degree exposes students to advanced concepts and diverse critical thinking skills that prepare them for future career opportunities and professional advancement.

Admission. Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree or equivalent from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and a 2.50 for nonresident applicants.

Degree Requirements. In addition to the A.A.S. degree, the B.A.S. in Applied Science through East College consists of 60 semester hours of upper-division (300-level and above) courses, with 30 semester hours in residence.

Assignable credit.....	6
B.A.S. core.....	15
General Studies.....	19
MWTC concentration.....	20
Total.....	60

General Studies Curriculum (19 hours). The B.A.S. curriculum builds on the general education content of the A.A.S. degree. Additional General Studies (L, CS, and awareness areas) are met with courses in the core or concentration. General Studies courses focus on contextual learning.

L.....	3
MA.....	3
HU.....	3
HU or SB.....	3
SB.....	3
SG.....	4
Total.....	19

Assignable Credit (6 hours). Assignable credit allows space in the curriculum for prerequisite courses needed for students to succeed in the program. The courses are determined by the student and an advisor.

B.A.S. core (15 hours). The area core is focused on management and organization, professional communication, qualitative analysis, and computer competency.

Multimedia Writing and Technical Communication concentration (20 hours). In consultation with an advisor, students will select 20 hours of upper-division TWC courses.

CERTIFICATE

A Multimedia Writing and Technical Communication Certificate is available and requires 18 semester hours.

TWC 301 General Principles of Multimedia Writing.....	3
TWC 401 Principles of Technical Communication.....	3
TWC 411 Principles of Visual Communication.....	3
or TWC 421 Principles of Writing with Technology (3)	
or TWC 431 Principles of Technical Editing (3)	
Three 400-level TWC courses, at least two of which	
must be genre courses, such as TWC 443 Proposal Writing	
or TWC 447 Business Reports.....	9
Total.....	18

MULTIMEDIA WRITING AND TECHNICAL COMMUNICATION (TWC)

TWC 194 Special Topics. (1–4)
not regularly offered

TWC 200 Impact of Communications Technology on Society. (3)
fall and spring
Organizational issues and development of technical communication. Activities include research, evaluations, and presentation of oral arguments in support of positions. Prerequisites: ENG 101 (or 105); 102. *General Studies: L*

TWC 294 Special Topics. (1–4)
not regularly offered

TWC 301 General Principles of Multimedia Writing. (3)
fall and spring
Introduction to writing in a variety of media, understanding the consequences of integrating media, and effective editing techniques. Prerequisite: First-Year Composition. *General Studies: L*

TWC 351 Technical Writing and Editing. (3)
fall and spring

Effective style, format, and organization of technical material; editing principles and practices; copyediting versus substantive editing; and document management. Prerequisite: ENG 102.

TWC 400 Technical Communications. (3)
fall, spring, summer

Planning and preparing technical publications and oral presentations based on directed library research related to current technical topics. Prerequisites: completion of first-year English requirements; General Studies L course; senior standing with a major in College of Technology and Applied Sciences. *General Studies: L*

TWC 401 Principles of Technical Communication. (3)
fall and spring

Basic information design principles to produce effective written, oral, and electronic technical communication. Understanding of rhetorical and audience analysis. Pre- or corequisite: TWC 301. *General Studies: L*

TWC 403 Writing for Professional Publication. (3)
not regularly offered

Analyzes the market and examines the publication process, including the roles of the author, editor, and reviewer. Pre- or corequisite: TWC 401.

TWC 411 Principles of Visual Communication. (3)
fall and spring

Basic principles of visual communication in print and electronic media. Understanding graphic and document design, including typography and color. Pre- or corequisite: TWC 401. *General Studies: L*

TWC 421 Principles of Writing with Technology. (3)
fall and spring

Understanding historical and social impact of technology on writing, with emphasis on multimedia design, computer-mediated communication, and hypertext. Pre- or corequisite: TWC 401. *General Studies: L*

TWC 431 Principles of Technical Editing. (3)*fall and spring*

Basic principles of technical editing (for print and electronic media) including copyediting, reviews, standards, style, and project management. Pre- or corequisite: TWC 401.

*General Studies: L***TWC 443 Proposal Writing. (3)***once a year*

Develops persuasive strategies and themes for researching and writing professional proposals. Pre- or corequisite: TWC 401.

TWC 444 Manual and Instructional Writing. (3)*once a year*

Design and development of a user manual, writing instructions, improving graphics and page design, and usability testing. Pre- or corequisite: TWC 401.

TWC 445 Computer Documentation. (3)*once a year*

Introduction to writing documentation for the computer industry. Pre- or corequisite: TWC 401.

TWC 446 Technical and Scientific Reports. (3)*once a year*

Introduction to strategies, formats, and techniques of presenting information to technical and scientific audiences. Pre- or corequisite: TWC 401.

*General Studies: L***TWC 447 Business Reports. (3)***once a year*

Introduction to strategies, formats, and techniques of presenting information to business and other workplace audiences. Pre- or corequisite: TWC 401.

*General Studies: L***TWC 484 Internship. (3)***fall and spring*

Applies classroom work in a supervised workplace environment. Pre- or corequisite: TWC 411 or 421 or 431.

TWC 490 Capstone. (3)*fall and spring*

Development of a professional portfolio, creation of a "culminating document," and synthesis of undergraduate experience. Prerequisite: instructor approval.

TWC 494 Special Topics. (1–4)*not regularly offered***TWC 501 Principles of Technical Communication. (3)***fall and spring*

Basic information design principles to produce effective written, oral, and electronic technical communication. Understanding of rhetorical and audience analysis. Pre- or corequisite: graduate standing.

TWC 503 Writing for Professional Publication. (3)*not regularly offered*

Analyzes the market and examines the publication process, including the roles of the author, editor, and reviewer. Pre- or corequisite: TWC 501.

TWC 511 Principles of Visual Communication. (3)*fall and spring*

Basic principles of visual communication in print and electronic media. Understanding graphic and document design, including typography and color. Pre- or corequisite: TWC 501.

TWC 521 Principles of Writing with Technology. (3)*fall and spring*

Understanding historical and social impact of technology on writing, with emphasis on multimedia design, computer-mediated communication, and hypertext. Pre- or corequisite: TWC 501.

TWC 531 Principles of Technical Editing. (3)*fall and spring*

Basic principles of technical editing for print and electronic media, including copyediting, reviews, standards, style, and project management. Pre- or corequisite: TWC 501.

TWC 543 Proposal Writing. (3)*once a year*

Develops persuasive strategies and themes for researching and writing professional proposals. Pre- or corequisite: TWC 501.

TWC 544 Manual and Instructional Writing. (3)*once a year*

Design and development of a user manual, writing instructions, improving graphics and page design, and usability testing. Pre- or corequisite: TWC 501.

TWC 545 Computer Documentation. (3)*once a year*

Introduction to writing documentation for the computer industry. Pre- or corequisite: TWC 501.

TWC 546 Technical and Scientific Reports. (3)*once a year*

Introduction to strategies, formats, and techniques of presenting information to technical and scientific audiences. Pre- or corequisite: TWC 501.

TWC 547 Business Reports. (3)*once a year*

Introduction to strategies, formats, and techniques of presenting information to business and other workplace audiences. Pre- or corequisite: TWC 501.

TWC 584 Internship. (3)*fall and spring*

Applies classroom work in a supervised workplace environment. Pre- or corequisites: TWC 511, 521, 531.

TWC 598 Special Topics. (1–4)*not regularly offered*

Department of Nutrition

Linda A. Vaughan
Chair
(HSC 1386) 480/727-1728

PROFESSORS

JOHNSTON, MANORE, VAUGHAN

ASSOCIATE PROFESSOR

MONTE

ASSISTANT PROFESSOR

HAMPL

SENIOR LECTURER

MARTIN

LECTURER

DIXON

NUTRITION—B.S.

The B.S. degree in Nutrition offers three concentrations: dietetics, human nutrition, and food and nutrition management. The dietetics concentration provides students with a comprehensive range of nutrition, foods, and science courses that meet the academic (didactic) requirements necessary to become a registered dietitian. This concentration has been granted Developmental Accreditation as a Didactic Program in Dietetics (DPD) by the Commission on Accreditation for Dietetics Education of the American Dietetic Association. Graduates of a DPD may apply for Dietetic Internships to establish eligibility to write the Dietetic Registration examination.

The human nutrition concentration provides a sound foundation in the basic sciences and nutrition, but no foods

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

courses are required. This program is often used by students who, while not seeking the credential of Registered Dietitian, are working towards a career in nutrition research or completing a premedical/pre dental program of study. The food and nutrition management concentration provides a number of nutrition, foods, and business courses and is offered to students with an interest in food production, nutrition program management, and food/nutrition marketing.

Accreditation. The B.S. degree in Nutrition with a concentration in dietetics has been granted Developmental Accreditation as a Didactic Program in Dietetics (DPD) by the Commission on Accreditation for Dietetics Education of the American Dietetic Association. For more information, call 1-800-877-1600, extension 5400, or write

COMMISSION ON ACCREDITATION FOR
DIETETICS EDUCATION
AMERICAN DIETETIC ASSOCIATION
216 W JACKSON BLVD
CHICAGO IL 60606-6995

Dietetics Concentration. The following NTR courses are required of all students in the dietetics concentration:

NTR 142 Applied Food Principles	3
NTR 241 Human Nutrition	3
NTR 341 Introduction to Planning Therapeutic Diets	3
NTR 343 Food Service Purchasing.....	3
NTR 344 Nutrition Services Management	3
NTR 350 Nutrition Counseling.....	3
NTR 400 Nutrition and Health Promotion.....	3
NTR 440 Advanced Human Nutrition I.....	3
NTR 441 Advanced Human Nutrition II	3
NTR 444 Diet Therapy	3
NTR 445 Quantity Food Production.....	3
NTR 446 Human Nutrition Assessment Lecture/Laboratory	3
NTR 448 Community Nutrition <i>L</i>	3
Total	39

In addition to the required NTR courses, the following related courses are required in order to complete the academic requirements of the Didactic Program in dietetics:

BCH 361 Principles of Biochemistry.....	3
BCH 367 Elementary Biochemistry Laboratory.....	1
BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
BIO 202 Human Anatomy and Physiology II.....	4
CHM 113 General Chemistry <i>SQ</i>	4
CHM 116 General Chemistry <i>SQ</i>	4
CHM 231 Elementary Organic Chemistry <i>SQ</i> ¹	3
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> ¹	1
MIC 205 Microbiology <i>SG</i> ²	3
MIC 206 Microbiology Laboratory <i>SG</i> ²	1
Statistics course.....	3
Technical writing course	3
Total	34

¹ Both CHM 231 and 235 must be taken to secure *SQ* credit.

² Both MIC 205 and 206 must be taken to secure *SG* credit.

Additional supporting courses in the social sciences are required for completion of the DPD and must be selected in consultation with the Nutrition academic advisor.

Human Nutrition Concentration. The following NTR courses are required of all students in the human nutrition concentration:

NTR 142 Applied Food Principles	3
NTR 241 Human Nutrition	3
NTR 341 Introduction to Planning Therapeutic Diets	3
NTR 440 Advanced Human Nutrition I.....	3
NTR 441 Advanced Human Nutrition II	3
NTR 444 Diet Therapy	3
NTR 446 Human Nutrition Assessment Lecture/Laboratory	3
Total	21

An additional nine semester hours from the Department of Nutrition are required to complete this concentration. A maximum of three semester hours of Independent Study may be used to satisfy this requirement. Students select these courses in consultation with the Nutrition academic advisor.

In addition to the required NTR courses, the following related courses are required to complete the academic requirements of this concentration:

BCH 361 Principles of Biochemistry.....	3
BCH 367 Elementary Biochemistry Laboratory.....	1
BIO 201 Human Anatomy and Physiology I <i>SG</i>	4
BIO 202 Human Anatomy and Physiology II.....	4
CHM 113 General Chemistry <i>SQ</i>	4
CHM 116 General Chemistry <i>SQ</i>	4
CHM 231 Elementary Organic Chemistry <i>SQ</i> ¹	3
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> ¹	1
MIC 205 Microbiology <i>SG</i> ²	3
MIC 206 Microbiology Laboratory <i>SG</i> ²	1
Total	28

¹ Both CHM 231 and 235 must be taken to secure *SQ* credit.

² Both MIC 205 and 206 must be taken to secure *SG* credit.

Food and Nutrition Management Concentration. The following NTR courses are required of all students in the food and nutrition management concentration:

NTR 100 Introductory Nutrition.....	3
or NTR 241 Human Nutrition (3)	
NTR 142 Applied Food Principles	3
NTR 343 Food Service Purchasing.....	3
NTR 344 Nutrition Services Management	3
NTR 442 Experimental Foods	3
NTR 445 Quantity Food Production.....	3
Total	18

An additional twelve semester hours from the Department of Nutrition are required to complete this concentration. A maximum of three semester hours of Independent Study may be used to satisfy this requirement. Students select these courses in consultation with the Nutrition academic advisor.

In addition to the required NTR courses, the following related courses are required to complete the academic requirements of this concentration:

CHM 101 Introductory Chemistry <i>SQ</i>	4
CHM 231 Elementary Organic Chemistry <i>SQ</i> ¹	3
CHM 235 Elementary Organic Chemistry Laboratory <i>SQ</i> ¹	1
MIC 205 Microbiology <i>SG</i> ²	3
MIC 206 Microbiology Laboratory <i>SG</i> ²	1
Business or technical writing course.....	3

Management (AGB 310 or MGT 301, 380, or 394)	3
Marketing (AGB 320 or MKT 300 or 394)	3
Other agribusiness or business courses ³	6
Total	27

- ¹ Both CHM 231 and 235 must be taken to secure SQ credit.
- ² Both MIC 205 and 206 must be taken to secure SG credit.
- ³ Courses taken to fulfill the final six credit business requirement should be taken from courses with the following prefixes: ACC, AGB, BUS, COB, CIS, CSE, ECN, FIN, GBS, HSA, IBS, MGT, MKT, and QBA. Students select these courses in consultation with the Nutrition academic advisor.

MINOR

The faculty of the Department of Nutrition also offers minors in Food and Nutrition Management and Human Nutrition, each requiring 18 semester hours. At least 12 of the 18 must be in upper-division courses.

Food and Nutrition Management. The Food and Nutrition Management minor requires that students take the following courses:

NTR 100 Introductory Nutrition	3
or NTR 241 Human Nutrition (3)	
NTR 142 Applied Food Principles	3
NTR 300 Computer Applications in Nutrition.....	3
NTR 343 Food Service Purchasing.....	3
or NTR 343 Nutrition Services Management (3)	
NTR 442 Experimental Foods	3
NTR 445 Quantity Food Production	3
Total	18

Human Nutrition. The Human Nutrition minor requires that students take the following courses:

NTR 241 Human Nutrition	3
NTR 341 Introduction to Planning Therapeutic Diets	3
NTR 440 Advanced Human Nutrition I.....	3
NTR 441 Advanced Human Nutrition II	3
NTR 444 Diet Therapy	3
Total	15

One additional upper-division (or graduate) course must be selected from among the following:

NTR 348 Cultural Aspects of Food	3
NTR 350 Nutrition Counseling.....	3
NTR 446 Human Nutrition Assessment Lecture/Laboratory	3
NTR 448 Community Nutrition <i>L</i>	3
NTR 450 Nutrition in the Life Cycle I.....	3
NTR 451 Nutrition in the Life Cycle II	3
NTR 531 Recent Developments in Nutrition.....	3
NTR 532 Current Research in Nutrition I.....	3
NTR 598 Special Topics	3

NUTRITION (NTR)

NTR 100 Introductory Nutrition. (3)
fall, spring, summer
 Basic concepts of human nutrition. Recent controversies in nutrition and how food choices affect personal health.

NTR 142 Applied Food Principles. (3)
fall and spring
 Applied scientific principles of food preparation and production. 2 hours lecture, 3 hours lab. Fee.

NTR 241 Human Nutrition. (3)
fall, spring, summer
 Principles of human nutrition. Emphasis on nutrient metabolism and the relationships between diet and disease. Prerequisite: CHM 101 (or its equivalent).

NTR 300 Computer Applications in Nutrition. (3)
spring
 Introduction to nutrition and food software, including dietary assessment and analysis, food inventory and control, and telecommunications. Lecture, computer lab. NTR 341 strongly recommended. Prerequisites: NTR 100 or 241; basic computer literacy.

NTR 341 Introduction to Planning Therapeutic Diets. (3)
fall and summer
 Cultural, health, and economic aspects of diet planning. Assessment of food and diet composition. Review of common therapeutic diets. Fee. Prerequisites: NTR 100 (or 241) and 142 (or their equivalents).

NTR 343 Food Service Purchasing. (3)
fall
 Introduction to purchasing systems, bid processes, receiving and storage procedures, and regulatory agencies involved in the food service industry. Prerequisite: NTR 142.

NTR 344 Nutrition Services Management. (3)
spring
 Organization, administration, and management of food and nutrition services in hospitals and other institutions. Field trips may be included. Prerequisites: NTR 100 (or 241) and 142 (or their equivalents).
General Studies: L

NTR 348 Cultural Aspects of Food. (3)
spring and summer
 Origins, development, and diversity of food preferences and dietary habits; food patterns, and attitudes of global populations and U.S. immigrants. Prerequisite: NTR 100 or 241 (or its equivalent).
General Studies: C

NTR 350 Nutrition Counseling. (3)
spring
 Counseling techniques in nutrition; interpersonal and communication skills in clinical and community sites; nutrition education for individuals and populations. Lecture, lab. Prerequisites: NTR 100 (or 241) and 142 (or their equivalents).

NTR 400 Nutrition and Health Promotion. (3)
fall and spring
 Role of nutrition in health promotion; application of academic knowledge in field practicum; components of professional development. Lecture, practicum. Prerequisites: NTR 341, 440 (or 441 or 444); senior standing in dietetics or human nutrition.

NTR 440 Advanced Human Nutrition I. (3)
fall
 Metabolic reactions and interrelationships of vitamins, minerals, and water. Prerequisites: BIO 202 and CHM 231 and NTR 241 (or their equivalents).

NTR 441 Advanced Human Nutrition II. (3)
spring
 Metabolic reactions and interrelationships of carbohydrate, lipid, and protein. Prerequisites: BCH 361 and BIO 202 and NTR 241 (or their equivalents).

NTR 442 Experimental Foods. (3)
fall and spring
 Food product development techniques, food evaluation and testing, and investigation of current research into food composition. 2 hours lecture, 3 hours lab. Fee. Prerequisites: CHM 231; NTR 142.

NTR 444 Diet Therapy. (3)
spring and summer
 Principles of nutritional support for prevention and treatment of disease. Prerequisites: BIO 201 and 202 and NTR 241 (or their equivalents).

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

NTR 445 Quantity Food Production. (3)*fall and spring*

Standardized methods of quantity food preparation, operation of institutional equipment, institutional menu planning, quantity food experiences. May require field trips. Lecture, lab. Fee. Prerequisites: NTR 100 (or 241) and 344 (or their equivalents).

NTR 446 Human Nutrition Assessment Lecture/Laboratory. (3)*spring*

Clinical and biochemical evaluation of nutritional status. 2 hours lecture, 3 hours lab. Fee. Prerequisites: BCH 361, 367; NTR 440 (or 441).

NTR 448 Community Nutrition. (3)*fall and spring*

Food-related behaviors; organization and delivery of nutrition services; program design, implementation, and evaluation strategies; nutrition assessment of populations. Prerequisite: NTR 241 (or its equivalent).

*General Studies: L***NTR 450 Nutrition in the Life Cycle I. (3)***fall*

Emphasis on nutritional needs and problems during pregnancy, lactation, infancy, and childhood. Prerequisite: NTR 100 or 241 (or its equivalent).

NTR 451 Nutrition in the Life Cycle II. (3)*spring*

Nutritional requirements and nutrition-related disorders of adolescence, middle adulthood, and later life. Prerequisite: NTR 100 or 241 (or its equivalent).

NTR 500 Research Methods in Nutrition. (3)*fall*

Experimental design; methods of data collection, laboratory analyses, and statistical analyses; development of thesis proposal. Lecture, lab. Fee. Prerequisites: 1 course each in advanced nutrition, biochemistry, and statistics.

NTR 531 Recent Developments in Nutrition. (1)*fall and spring*

Selected topics addressing current issues in nutrition research. Prerequisites: 1 course each in advanced nutrition and biochemistry.

NTR 532 Current Research in Nutrition. (3)*spring*

Vitamins and minerals. Prerequisites: 1 course each in advanced nutrition and biochemistry.

NTR 540 Advanced Micronutrient Metabolism. (3)*fall*

Metabolism of vitamins and minerals, primarily as applied to humans, with research literature emphasized. Prerequisites: 1 course each in basic nutrition and biochemistry.

NTR 541 Advanced Macronutrient Metabolism. (3)*spring*

Metabolism of protein, fat, and carbohydrate, primarily as applied to humans, with research literature emphasized. Prerequisites: 1 course each in basic nutrition and biochemistry.

NTR 542 Advanced Food Product Development. (3)*fall and spring*

Food product development techniques, food evaluation and testing, and investigation of current research into food composition. 2 hours lecture, 3 hours lab. Fee. Prerequisites: CHM 231 and NTR 142 (or their equivalents).

NTR 544 Therapeutic Nutrition. (3)*spring and summer*

Current theories of the nutritional prevention or treatment of various diseases. Prerequisites: 1 course each in basic nutrition, introduction to diet therapy, and physiology.

NTR 545 Recent Developments in Institutional Feeding. (3)*fall and spring*

Current practices in institutional feeding, including supervised practicum with local quantity food operation. 1 hour lecture, 6 hours lab. Fee. Prerequisites: NTR 142 and 344 (or their equivalents).

NTR 546 Assessment Techniques in Nutrition. (3)*spring*

Clinical and biochemical evaluation of nutritional status. 2 hours lecture, 3 hours lab. Fee. Prerequisites: 1 course each in advanced nutrition, biochemistry, and physiology.

NTR 548 Nutrition Program Development. (3)*fall and spring*

Planning, development, implementation, and evaluation of community nutrition programs, including the process of grant applications. Prerequisites: 1 course each in basic nutrition and sociology.

NTR 550 Advanced Maternal and Child Nutrition. (3)*fall*

In-depth review of metabolic characteristics and nutritional needs of the pregnant woman, lactating woman, infant, and child. Prerequisites: 1 course each in basic nutrition, biochemistry, and physiology.

NTR 551 Advanced Geriatric Nutrition. (3)*spring*

In-depth review of metabolic characteristics and nutritional requirements of the elderly. Prerequisites: 1 course each in basic nutrition, biochemistry, and physiology.

NTR 580 Dietetics Practicum. (3–9)*fall, spring, summer*

Structured practical experience in the Dietetic Internship, supervised by practitioners with whom the student works closely. Practicum. Prerequisite: acceptance into the Dietetic Internship.

NTR 592 Research. (1–12)*not regularly offered***NTR 593 Applied Project. (1–12)***not regularly offered***NTR 594 Conference and Workshop. (1–12)***not regularly offered***NTR 598 Special Topics. (1–4)***not regularly offered*

In-depth review of recent research in areas including nutrition and exercise, nutrition and immunology, energy balance, vegetarianism, nutritional pathophysiology. Fee. Prerequisites: 1 course each in advanced nutrition, biochemistry, and physiology.

College of Technology and Applied Sciences

Albert L. McHenry, Dean

www.east.asu.edu/ctas

PURPOSE

The College of Technology and Applied Sciences (CTAS) helps students develop knowledge and skill in technological fields that qualify them for career positions and leadership responsibility in industry, government, and commercial enterprise. Each student is guided to select a major that addresses short-term employment goals through state-of-the-art technological preparation. Long-term career aspirations are supported through the development of a strong base in mathematics, science, engineering, and technical principles, coupled with a solid foundation in liberal arts and a commitment to lifelong learning.

Engineering technology programs offer professional preparation through a B.S. degree that stresses state-of-the-art technological applications. Special emphasis is placed on the development of knowledge and skill in applied mathematics, natural sciences, and engineering principles with formal laboratory experiences. This mixed educational approach provides the basis for both employment and a long-term career evolution.

The other CTAS technology programs provide the opportunity for students to develop knowledge and skill in solving broad-scale industrial problems, operating modern technological systems, and managing personnel in the implementation of processes and production. Programs of study focus on the latest technologies in areas such as aviation flight training and management, environmentally hazardous waste management, graphic communications, interactive computer graphics, and industrial management.

Each student is encouraged to participate in creative activities through a close relationship with a faculty mentor. Learning through execution of the scientific method, using both inductive and deductive processes in applied research activities, is essential for both faculty and students.

ORGANIZATION

The College of Technology and Applied Sciences is composed of the following four academic units:

- Department of Aeronautical Management Technology
- Department of Electronics and Computer Engineering Technology
- Department of Information and Management Technology
- Department of Manufacturing and Aeronautical Engineering Technology

DEGREES

See the "College of Technology and Applied Sciences Baccalaureate Degrees and Majors" table, page 634. For graduate degrees, see the "East College Graduate Degrees and Majors" table, page 622.

The College of Technology and Applied Sciences offers programs leading to the B.S. degree and B.A.S. degree. The college also offers the Master of Science in Technology (M.S.T.) degree. For more information on courses, faculty, and programs in the M.S.T. degree, see the *Graduate Catalog*.

ACCREDITATION

Undergraduate B.S. degree programs in Aeronautical Engineering Technology, Electronics Engineering Technology, and Manufacturing Engineering Technology are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. For additional information, call 410/347-7700 or write

TECHNOLOGY ACCREDITATION COMMISSION OF
THE ACCREDITATION BOARD FOR
ENGINEERING AND TECHNOLOGY INC
111 MARKET PLACE SUITE 1050
BALTIMORE MD 21202-7102

Both the airway science flight management and the airway science management concentrations in the Department of Aeronautical Management Technology are fully accredited by the Council on Aviation Accreditation. For more information call 334/844-2431, send e-mail to caa@auburn.edu, or write

COUNCIL ON AVIATION ACCREDITATION
3410 SKYWAY DRIVE
AUBURN AL 36830

ADMISSION—B.S. DEGREE

The College of Technology and Applied Sciences admits first-year students who meet the undergraduate admission requirements of Arizona State University. See "Undergraduate Admission," page 54. High school precalculus, physics, and chemistry are recommended. Transfer applicants must meet the university requirements for transfer students as specified under "Transfer Credit," page 57, with the exception that Arizona resident transfer students must have a 2.25 GPA.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

College of Technology and Applied Sciences Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Aeronautical Engineering Technology*	B.S.	—	Department of Manufacturing and Aeronautical Engineering Technology
Aeronautical Management Technology*	B.S.	Airway science flight management, airway science management	Department of Aeronautical Management Technology
Applied Science	B.A.S.	Aviation maintenance management technology, aviation management technology, computer systems administration, digital media management, digital publishing, emergency management, fire service management, instrumentation, microcomputer systems, municipal operations management, operations management, production technology, semiconductor technology, software technology applications, technical graphics	Bachelor of Applied Science Advisory Committee
Computer Engineering Technology*	B.S.	Computer hardware technology, embedded systems technology, software technology	Department of Electronics and Computer Engineering Technology
Electronics Engineering Technology*	B.S.	Electronic systems, microelectronics, telecommunications	Department of Electronics and Computer Engineering Technology
Industrial Technology	B.S.	Environmental technology management, graphic information technology, industrial technology management	Department of Information and Management Technology
Manufacturing Engineering Technology*	B.S.	Manufacturing engineering technology, mechanical engineering technology	Department of Manufacturing and Aeronautical Engineering Technology

* This major requires more than 120 semester hours to complete.

Students admitted to a B.S. degree program in CTAS begin study under one of two student classifications, professional or preprofessional.

Professional Status

First-year students (new freshmen) are admitted to CTAS with professional status if they meet the general aptitude criteria for admission and have no deficiencies in the basic competency requirements for admission. First-year students admitted upon completion of the GED are admitted with professional status if they have also achieved the minimum ACT or SAT scores required for undergraduate admission to the university.

Students transferring from other ASU colleges are admitted to CTAS with professional status if they have no remaining admissions deficiencies and meet the required GPA.

Transfer students from other institutions must meet the minimum admission requirements for college transfer students as described under "Transfer Credit," page 57. The CTAS also requires resident transfer students to have a cumulative GPA of 2.25.

All international students must have a minimum 500 TOEFL score to be admitted with professional status.

Preprofessional Status

All other students are admitted with preprofessional status and may apply for professional status after they have removed the deficiency that disallows awarding professional

status. Students with preprofessional status may not register for 300- and 400-level courses in the college until they have been awarded professional status. See an advisor for details.

Transfer Credit

Credit for courses taken at a community college or another four-year institution is awarded according to the guidelines under "Transfer Credit," page 57. Students who are transferring from an Arizona community college and have been in continuous residence may continue under the catalog in effect at the time of their entrance into the community college. Students should be aware that some course work that transfers to ASU may not be applicable toward CTAS degree requirements. Students should confer with an advisor. The College of Technology and Applied Sciences maintains a cooperative agreement with most Arizona community colleges and with selected out-of-state colleges and universities to structure programs that are directly transferable into the technology programs at ASU East. For assistance in the transfer from Arizona community colleges, transfer guides are available at www.asu.edu/provost/articulation.

Courses taken more than five years before admission to a CTAS degree program are not normally accepted for transfer credit at the option of the department in which the applicant wishes to enroll. Courses completed within the five years preceding admission are judged as to their applicability to the student's curriculum.

College of Technology and Applied Sciences Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Technology	M.S.Tech.	Global technology and development Aviation human factors, aviation management technology Computer systems engineering technology, electronic systems engineering technology, instrumentation and measurement technology, microelectronics engineering technology Environmental technology management, fire service administration, information technology, management of technology Aeronautical engineering technology, manufacturing engineering technology, mechanical engineering technology, security engineering technology	College of Technology and Applied Sciences Department of Aeronautical Management Technology Department of Electronics and Computer Engineering Technology Department of Information and Management Technology Department of Manufacturing and Aeronautical Technology

ADMISSION—B.A.S. DEGREE

Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and a 2.50 for nonresident applicants.

ADVISING

New incoming and transfer students should seek initial advising from the academic advisor in the Dean's Office. CTAS students are then assigned faculty advisors who assist them with planning a program of study in the department of their major. The college requires that students consult with advisors before registering each semester. Advisors should be made aware of any employment obligations or special circumstances that may affect a student's ability to successfully handle a full course load. CTAS students may register for a maximum of 19 semester hours per semester. Any student wishing to take more than the maximum must petition the CTAS Standards Committee and have an approval on file before registering for an overload.

GRADUATION REQUIREMENTS

Students must meet all university graduation requirements given in "University Graduation Requirements," page 74, as well as degree requirements of their major in the College of Technology and Applied Sciences. For detailed information on the degree requirements of a major in CTAS, refer to that department's individual description.

COLLEGE STANDARDS**Pass/Fail Grades**

The College of Technology and Applied Sciences does not offer pass/fail grades. Courses graded on a pass/fail basis do not count toward degree credit in CTAS. Students may request credit for pass/fail courses by petitioning the CTAS Standards Committee.

Entry into Upper-Division Courses (B.S. Degree)

Before enrolling in courses at the 300 level and above, CTAS students must be in the professional status within the college. Students who are not in good academic standing must petition the CTAS Standards Committee. Students enrolled in another ASU college may not register for any 300- and 400-level CTAS courses unless those courses are required in the degree program and the students have the proper course prerequisites.

ACADEMIC STANDARDS

Retention. A student is expected to make satisfactory progress toward completion of degree requirements to continue enrollment in the College of Technology and Applied Sciences. Any one of the following conditions is considered unsatisfactory progress and results in the student's being placed on probationary status:

1. a semester or summer session with a GPA less than or equal to 1.50;
2. two successive semesters with GPAs less than 2.00; or
3. an ASU cumulative GPA less than 2.00.

A student on probation is subject to disqualification if (1) a semester GPA of 2.25 is not attained and the cumulative GPA is below 2.00 at the end of the probationary semester or (2) the student is placed on probation for two consecutive semesters and is unable to achieve the standard GPAs stated in number one.

Students on academic probation are not allowed to register for more than 13 semester hours. Probationary students may not register for the semester following the semester in which they were declared probationary without a special permit from an advisor in the dean's office. Special permits are given only after the registrar records grades for the current semester.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Disqualification. During a semester on academic probation, a student who fails to meet the retention standards is disqualified. Students may request a review of their disqualification status by contacting the CTAS associate dean in the Academic Center Building (CNTR), room 10. Any disqualified student who is accepted by another college at ASU may not register for courses in CTAS unless the courses are required in the new major. Disqualified students who register for courses in CTAS may be withdrawn from these courses any time during the semester.

Reinstatement. The college does not accept an application for reinstatement until the disqualified student has remained out of the college for at least a 12-month period. Merely having remained in disqualified status for this period of time does not, in itself, constitute a basis for reinstatement. Proof of ability to do satisfactory college work in the chosen discipline is required; for example, completing pertinent courses in the discipline at a community college with higher-than-average grades.

STUDENT RESPONSIBILITIES

Course Prerequisites. Students should consult the *Schedule of Classes* and the catalog for course prerequisites. Students who register for courses without the designated prerequisites may be withdrawn without their consent at any time before the final examination. The instructor, the chair of the department, or the dean of the college may initiate such withdrawals. In such cases, students do not receive monetary reimbursement. Such withdrawals are considered to be unrestricted as described under "Unrestricted Course Withdrawal," page 68, and do not count against the number of restricted withdrawals allowed.

SPECIAL PROGRAMS

Academic Recognition. Students completing baccalaureate degree requirements receive the appropriate honors designations on their diplomas consistent with the requirements specified by the university.

Students in the college are encouraged to seek information concerning entry into honor societies that enhance their professional stature. Tau Alpha Pi is the engineering technology honor society, and Alpha Eta Rho is available for aeronautical management technology students.

Barrett Honors College. The College of Technology and Applied Sciences participates in the programs of the Craig and Barbara Barrett Honors College, which provides enhanced educational experiences to academically superior undergraduate students. Participating students can major in any academic program. For more information see "The Craig and Barbara Barrett Honors College," page 112.

Scholarships. Information and applications for academic scholarships for continuing students may be obtained by contacting departmental offices. Other scholarships may be available through the university Student Financial Assistance Office.

ROTC Students. Students pursuing a commission through either the Air Force or Army ROTC program must take from 12 to 20 semester hours of courses in the Department of Aerospace Studies or Department of Military Science. To preclude excessive overloads, these students should plan on

at least one additional semester to complete degree requirements. Because of accreditation requirements, aerospace studies (AES) or military science (MIS) courses are not accepted in the engineering technology majors.

ENGINEERING TECHNOLOGY CORE (ETC)

ETC 100 Languages of Technology. (4)

fall and spring

Introduction to computer-aided design, programming, modeling, and technical documentation. Lecture, lab.

General Studies: CS

ETC 191 First-Year Seminar. (1-3)

not regularly offered

ETC 194 Special Topics. (1-4)

not regularly offered

ETC 201 Applied Electrical Science. (4)

fall, spring, summer

Principles of electricity, passive elements, and AC/DC circuit analysis. Laboratory exploration of circuits using instrumentation and the computer as tools. Lecture, lab. Prerequisites: ETC 100; MAT 170; PHY 112, 114.

ETC 211 Applied Engineering Mechanics: Statics. (3)

fall and spring

Vectors, forces and moments, force systems, equilibrium, analysis of basic structures and structural components, friction, centroids, and moments of inertia. Prerequisites: MAT 260; PHY 111, 113.

ETC 340 Applied Thermodynamics and Heat Transfer. (3)

fall and spring

Thermodynamic systems and processes, first and second laws of thermodynamics, properties of pure substances, and applications to heat engines and special systems. Fundamentals of conduction, radiation, and convection. Prerequisites: MAT 261; PHY 112, 114.

ETC 492 Honors Directed Study. (1-6)

not regularly offered

ETC 493 Honors Thesis. (1-6)

not regularly offered

Department of Aeronautical Management Technology

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Chair

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PROFESSOR

GESELL

ASSOCIATE PROFESSORS

JACKSON, McCURRY, TURNEY

ASSISTANT PROFESSORS

KARP, PEARSON

LECTURER

O'BRIEN

PURPOSE

Graduates are prepared for entry into the aviation and aerospace industry in productive, professional employment or, alternatively, for graduate study. Curricula emphasize principles underlying the application of technical knowledge as well as current technology, preparing the graduate to adapt to the rapid and continual changes in aviation and aerospace technology.

ADMISSION

New and transfer students who have been admitted to the university and who meet the requirements for admission to the College of Technology and Applied Sciences may be admitted without separate application to the Department of Aeronautical Management Technology. Students are cleared for enrollment in Airway Science Flight Management flight courses on a competitive basis. Transfer credits are reviewed by department faculty advisors. To be acceptable for department credit, transfer courses must be equivalent in both content and level of offering.

DEGREES

The faculty in the Department of Aeronautical Management Technology offer a B.S. degree in Aeronautical Management Technology with concentrations in airway science flight management and airway science management. A B.A.S. degree in Applied Science is also offered with concentrations in aviation maintenance management technology and aviation management technology.

A Master of Science in Technology degree is offered for graduate study with concentrations in aviation management technology and aviation human factors. For more information, see the *Graduate Catalog*.

AERONAUTICAL MANAGEMENT TECHNOLOGY—B.S.

The Aeronautical Management Technology curricula are designed to provide a thorough technical background combined with an interdisciplinary general university education. The graduate is prepared to assume responsibilities in a wide area of managerial and technically related areas of aviation. The student gains a background in aircraft structures, reciprocating and turbine engines, aircraft performance and design, management skills, business principles, systems analysis, and a variety of course work specific to aircraft flight, airport operations, and air transportation systems. The degree offers two concentrations: airway science flight management and airway science management, both of which have been accredited by the Council on Aviation Accreditation. The concentrations are described separately on the following pages.

All degree requirements are shown on curriculum check sheets for the concentrations that are available by visiting the department or by accessing the department Web site at eastair.east.asu.edu. Requirements include First-Year Composition, university General Studies (see "General Studies," page 78), and the Aeronautical Management Technology Core. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses. Refer to individual concentration degree requirements for additional required courses. Students must complete each Aeronautical Management Technology course with a grade of "C" or higher.

Aeronautical Management Technology Core

AMT 101 Introduction to Aeronautical Management Technology.....	1
AMT 182 Private Pilot Ground School	3
AMT 201 Air Traffic Control	3

AMT 220 Aviation Meteorology	3
AMT 280 Aerospace Structures, Materials, and Systems	4
AMT 287 Aircraft Powerplants	4
AMT 308 Air Transportation G	3
AMT 396 Aviation Professional	1
AMT 410 Aviation Safety and Human Factors	3
AMT 442 Aviation Law/Regulations.....	3
ETC 100 Languages of Technology CS	4
ETC 201 Applied Electrical Science	4
Total	36

Airway Science Flight Management Concentration

Flight training is certified by the Federal Aviation Administration. Students in the airway science flight management concentration must pass an FAA medical examination before flying solo. While this physical examination is not required for admission to the program, it must be completed before flying solo as the medical certificate becomes the student pilot certificate. An FAA Class II medical examination is required to complete the certificates and ratings necessary to meet graduation requirements. It is recommended that a Class I FAA medical examination be completed by an aviation medical examiner of the student's choice before the start of classes.

Airway science flight management combines academic studies and flight training to prepare graduates for a wide variety of positions within the air transportation industry, including general, airline, and military aviation. Ground school and flight training are available, allowing the student to obtain private pilot, commercial pilot, and flight instructor certificates and also the instrument pilot, instrument instructor, and multiengine pilot ratings.

This curriculum concentrates on flying plus the technical management and computer-related applications necessary to operate in the high-density environment of modern airspace. The program also emphasizes critical thinking, analytical skills, and oral and written communication skills. A career in airway science flight management leads to the development, administration, and enforcement of safety regulations, including airworthiness and operational standards in civil aviation.

While enrolled at ASU, students do not receive college credit for flight activity or instruction received at flight schools other than those entities with which the university has currently contracted for such instruction. Consideration is given for flight experience received before enrollment at the university through the private pilot certificate only.

Flight instruction costs are not included in university tuition and fees. The estimated cost of flight training is \$36,000 in addition to normal university costs.

Degree Requirements

Airway science flight management students are required to complete 128 semester hours with a 2.00 cumulative GPA, including a minimum of 50 semester hours of upper-division courses. All degree requirements are shown on the student's curriculum check sheet.

Concentration Requirements

In addition to the required courses for First-Year Composition, university General Studies (see "General Studies,"

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

page 78), and the Aeronautical Management Technology core, the following additional courses are required for the airway science flight management concentration:

AET 300 Aircraft Design I.....	3
AMT 100 Flight Safety I.....	1
AMT 200 Flight Safety II.....	2
AMT 214 Commercial/Instrument Ground School I.....	3
AMT 300 Flight Safety III.....	2
AMT 322 Commercial/Instrument Ground School II.....	3
AMT 382 Air Navigation.....	3
AMT 385 Flight Instructor Ground School.....	3
AMT 387 Multiengine Pilot Ground School.....	1
AMT 392 Flight Instructor Instrument Ground School.....	2
AMT 400 Flight Safety IV.....	1
AMT 408 National Aviation Policy.....	3
AMT 444 Airport Management and Planning.....	3
AMT 482 Airline Instrument Procedures.....	3
AMT 489 Airline Administration.....	3
AMT 496 Airline Aircraft Systems Capstone.....	3
IMC 346 Management Dynamics.....	3
Technical electives.....	6
Total.....	48

Suggested Course Pattern for Freshmen

First Semester

AMT 100 Flight Safety I.....	1
AMT 101 Introduction to Aeronautical Management Technology.....	1
AMT 182 Private Pilot Ground School.....	3
AMT 220 Aviation Meteorology.....	3
ENG 101 First-Year Composition.....	3
MAT 170 Precalculus <i>MA</i>	3
Total.....	14

Second Semester

AMT 214 Commercial/Instrument Ground School I.....	3
ENG 102 First-Year Composition.....	3
ETC 100 Languages of Technology <i>CS</i>	4
MAT 260 Technical Calculus I <i>MA</i>	3
PHY 111 General Physics <i>SQ*</i>	3
PHY 113 General Physics Laboratory <i>SQ*</i>	1
Total.....	17

* Both PHY 111 and 113 must be taken to secure SQ credit.

Airway Science Management Concentration

The airway science management concentration is designed to prepare graduates for managerial and supervisory positions throughout the air transportation industry. An in-depth technical education is included along with broad exposure to business and management courses. This program of study is interdisciplinary in nature and prepares the aeronautical career-oriented student for positions such as air traffic control specialist, air carrier manager, airport manager, and general aviation operations manager.

Degree Requirements

Airway science management students are required to complete 128 semester hours with a 2.00 cumulative GPA, including a minimum of 50 semester hours of upper-division courses. All degree requirements are shown on the student's curriculum check sheet.

Concentration Requirements

In addition to the required courses for First-Year Composition, university General Studies (see "General Studies," page 78), and the Aeronautical Management Technology

core, the following additional courses are required in the airway science management concentration:

ACC 230 Uses of Accounting Information I.....	3
AMT 408 National Aviation Policy.....	3
AMT 444 Airport Management and Planning.....	3
AMT 489 Airline Administration.....	3
AMT 491 Aviation Management Capstone.....	3
IMC 346 Management Dynamics.....	3
ITM 343 Occupational Safety and Ergonomics.....	3
ITM 430 Ethical Issues in Technology.....	3
ITM 452 Industrial Human Resource Management.....	3
ITM 456 Introduction to Organized Labor.....	3
ITM 480 Organizational Effectiveness.....	3
Technical electives.....	15
Total.....	48

Suggested Course Pattern for Freshmen

First Semester

AMT 101 Introduction to Aeronautical Management Technology.....	1
AMT 182 Private Pilot Ground School.....	3
AMT 220 Aviation Meteorology.....	3
ENG 101 First-Year Composition.....	3
MAT 170 Precalculus <i>MA</i>	3
Total.....	13

Second Semester

ENG 102 First-Year Composition.....	3
ETC 100 Languages of Technology <i>CS</i>	4
MAT 260 Technical Calculus I <i>MA</i>	3
PHY 111 General Physics <i>SQ*</i>	3
PHY 113 General Physics Laboratory <i>SQ*</i>	1
General Studies elective.....	3
Total.....	17

* Both PHY 111 and 113 must be taken to secure SQ credit.

APPLIED SCIENCE—B.A.S.

The Bachelor of Applied Science degree is a "capstone" degree for the Associate of Applied Science degree. The B.A.S. degree exposes students to advanced concepts and diverse critical thinking skills that prepare students for future career opportunities and professional advancement.

Admission

Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and a 2.50 for nonresident applicants.

Degree Requirements

The B.A.S. degree in the College of Technology and Applied Sciences consists of 60 semester hours of upper-division (300 level and above) courses, with 30 hours in residence.

A.A.S. degree transfer.....	60
Assignable credit.....	6
B.A.S. core.....	15
General Studies.....	19
Technical concentration.....	20
Total.....	120

General Studies Curriculum

The B.A.S. curriculum builds on the general education content of the A.A.S. degree. Additional General Studies (L, CS and awareness areas) are met with courses in the core concentration. General Studies courses focus on contextual learning.

L.....	3
MA.....	3
HU.....	3
HU or SB.....	3
SB.....	3
SG.....	4
Total.....	19

Assignable Credit

Assignable credit allows space in the curriculum for pre-requisite courses needed to succeed in the program. The courses are determined by the student and the advisor.

B.A.S. Core

The area core is focused on management and organization, professional communication, quantitative analysis, and computer competency.

GIT 494 ST: Computer Systems Applications.....	3
IMC 346 Management Dynamics.....	3
or ITM 344 Industrial Organization (3)	
or ITM 452 Industrial Human Resource	
Management (3)	
IMC 470 Project Management.....	3
STP 420 Introductory Applied Statistics <i>CS</i>	3
TWC 400 Technical Communications <i>L</i>	3
Total.....	15

Technical Concentrations

Aviation Maintenance Management Technology. This concentration is for those students who have completed an airframe and powerplant certification as part of their A.A.S. degree. Students receive an orientation in management practices that prepares them for progressively more responsible positions in the field of aviation maintenance management.

Aviation Management Technology. This concentration is for those students who have received training and education in some aspect of the air transportation industry (other than aviation maintenance), such as flight certificates and ratings as part of their A.A.S. degree. Students receive an orientation in management practices that prepares them for progressively more responsible positions in the field of aviation management.

STUDENT ORGANIZATIONS

The department hosts the local chapter of Alpha Eta Rho, an international professional aviation fraternity open to all students with an interest in aviation. The American Association for Airport Executives is open to all students with an interest in airport management. The Student Advisory Council is a leadership organization that facilitates student communication with faculty, departmental leaders, and university administrative personnel. The Precision Flight Team competes in regional and national flying safety competi-

tions. Women in Aviation is an international organization that is open to all students.

AERONAUTICAL MANAGEMENT TECHNOLOGY (AMT)

AMT Note 1. Flight instruction costs are not included in university tuition and fees.

AMT 100 Flight Safety I. (1)

fall, spring, summer

Supervised private pilot flight training and flight safety briefings. Continuous enrollment required until completion of the FAA Private Pilot Certificate. Lecture, lab. Fee. See AMT Note 1. Corequisite: AMT 182 or 220 (or its equivalent).

AMT 101 Introduction to Aeronautical Management Technology. (1)

fall and spring

Facilitates entry into Aeronautical Management Technology programs. Emphasizes *General Catalog* and concentration requirements, registration, careers, and ASU East facilities.

AMT 182 Private Pilot Ground School. (3)

fall, spring, summer

Ground school preparation for Private Pilot Certificate. Aerodynamics, navigation, performance, and regulations. Lecture, lab. Corequisite: AMT 220.

AMT 194 Special Topics. (1–4)

not regularly offered

AMT 200 Flight Safety II. (2)

fall, spring, summer

Supervised commercial instrument flight training and safety briefings. Continuous enrollment required until completion of FAA Commercial Pilot Certificate with Instrument Rating. Lecture, lab. Fee. See AMT Note 1. Prerequisites: AMT 100; Private Pilot Certificate. Pre- or corequisite: AMT 214 or 322.

AMT 201 Air Traffic Control. (3)

fall

Ground and air operations; weather services communications and routing; flight plans, IFR operations, departures and arrivals; and airport conditions and emergencies. Prerequisite: AMT 182.

AMT 214 Commercial/Instrument Ground School I. (3)

fall and spring

Ground school leading to FAA Instrument Pilot Rating/Commercial Pilot Certificate (part 1 of 2). 10 hours ground trainer included. Lecture, lab. Fee. Pre- or corequisites: AMT 182, 220.

AMT 220 Aviation Meteorology. (3)

fall, spring, summer

Evaluation, analysis, and interpretation of atmospheric phenomena. Low- and high-altitude weather from the pilot's viewpoint. Corequisite: AMT 182.

AMT 280 Aerospace Structures, Materials, and Systems. (4)

fall

Basic aerodynamics, incompressible/compressible airflow, wind tunnel testing, wing theory; analysis of aircraft structures; properties and applications of materials, and aircraft systems. Lecture, lab. Fee. Prerequisites: PHY 111, 113.

AMT 287 Aircraft Powerplants. (4)

spring

Theory and performance analysis of gas turbine and reciprocating aircraft engines. Engine accessories, systems, and environmental control. Lecture, lab. Prerequisite: AMT 280.

AMT 300 Flight Safety III. (2)

fall, spring, summer

Supervised instructor flight training and safety briefings. Continuous enrollment required until completion of FAA Flight Instructor Certificate with Instrument Instructor Rating. Lecture, lab. Fee. See AMT Note 1. Prerequisite: AMT 200. Pre- or corequisite: AMT 385.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

AMT 308 Air Transportation. (3)*fall*

Study of the historical and international development of air transportation and its social, political, and economic impact upon global interrelationships. Prerequisite: junior standing.

General Studies: G

AMT 322 Commercial/Instrument Ground School II. (3)*spring*

Ground school leading to FAA Instrument Pilot Rating/Commercial Pilot Certificate (part 2 of 2). 10 hours ground trainer included. Lecture, lab. Fee. Prerequisite: Private Pilot Certificate. Pre- or corequisite: AMT 214.

AMT 360 Introduction to Helicopter Technology. (3)*not regularly offered*

Introduction to the working functions of modern rotary wing aircraft, rotary wing flight theory, aerodynamics, controls, flight, and power requirements. Prerequisites: PHY 111, 113.

AMT 370 Air Freight Operations. (3)*not regularly offered*

Air freight operations in National Aviation System; ramp operations, loading, weight and balance, and administration of airside and ground-side operations. Prerequisite: junior standing.

AMT 382 Air Navigation. (3)*spring*

Theory and application of modern advanced navigation and flight instrument systems. Introduction to crew resource management in multiplace cockpits. Lecture, lab. Prerequisite: AMT 322.

AMT 385 Flight Instructor Ground School. (3)*fall and spring*

Ground school in preparation for the FAA Flight Instructor Certificate. Lecture, lab. Pre- or corequisite: AMT 322.

AMT 387 Multiengine Pilot Ground School. (1)*fall and spring*

Ground school preparation for the FAA Multiengine Rating. Lecture, lab. Fee. See AMT Note 1. Pre- or corequisite: AMT 200 or instructor approval.

AMT 391 Multiengine Instructor Ground School. (2)*not regularly offered*

Ground school preparation for the FAA Multiengine Flight Instructor Rating. Lecture, lab. See AMT Note 1. Prerequisites: AMT 300, 387, 400.

AMT 392 Flight Instructor Instrument Ground School. (2)*fall and spring*

Ground school preparation for the FAA Instrument Flight Instructor Rating. Lecture, lab. See AMT Note 1. Prerequisite: AMT 385. Pre- or corequisite: AMT 200.

AMT 395 Multiengine Land, Airplane Flight Instructor Rating. (1)*not regularly offered*

Normal and emergency flight operations. Instruction techniques and procedures for light multiengine land, airplane. CFIAME Rating required for course completion. Lecture, lab. See AMT Note 1. Prerequisite: AMT 391.

AMT 396 Aviation Professional. (1)*fall and spring*

Career focus for management and flight students, including internships, résumé writing, interviews, and employment search in aviation industry. Prerequisite: junior standing.

AMT 400 Flight Safety IV. (1)*fall, spring, summer*

Multiengine and crew training and safety briefings. Continuous enrollment required until completion of rating and multicrew training. Lecture, lab. Fee. See AMT Note 1. Prerequisite: AMT 300. Pre- or corequisite: AMT 387.

AMT 408 National Aviation Policy. (3)*fall*

Examination of aviation and airspace policies and policy process, including agencies involved in formulation, implementation, and evaluation of aviation policy. Prerequisite: AMT 308.

AMT 409 Nondestructive Testing and Quality Assurance. (1)*not regularly offered*

Purpose of inspection and quality assurance. Theory and application of nondestructive inspection methods. Application of pertinent standards, specifications, and codes. Lecture, lab. Cross-listed as AET 409. Credit is allowed for only AET 409 or AMT 409. See AMT Note 1. Prerequisite: AMT 280 or MET 230.

AMT 410 Aviation Safety and Human Factors. (3)*fall*

Aviation accident prevention, human factors, life support, fire prevention, accident investigation, and crash survivability. Development and analysis of aviation safety programs. Prerequisites: junior standing; completion of 1 semester of General Studies L requirement.

AMT 412 Air Transportation Research. (1)*fall*

Survey of practical research methodology in use in the air transportation industry. Topics include planning and design considerations.

AMT 419 Aviation Logistical Management. (3)*spring*

Survey of FAA requirements for personnel and facilities. Topics include parts supply, quality control, product liability, pricing, profitability, and administration. Lecture, lab. Prerequisite: junior standing.

AMT 442 Aviation Law/Regulations. (3)*fall*

Aviation within context of U.S. Common Law system. Public law, administrative rule making, sovereignty, enforcement, and case law analysis. Prerequisite: junior standing.

AMT 444 Airport Management and Planning. (3)*spring*

Orientation to administration and management of modern public airports, including overview of planning, funding, and development of airport facilities. Prerequisite: AMT 308.

AMT 482 Airline Instrument Procedures. (3)*fall*

Advanced instrument flight using airline instrument procedures and airline crew and cockpit resource management. Lecture, lab. Prerequisites: AMT 322, 382.

AMT 484 Aeronautical Internship. (1–12)*fall, spring, summer*

Work experience assignment with aerospace industry commensurate with student's program. Special project guidance by industry with university supervision. Prerequisites: advisor approval; junior standing.

AMT 489 Airline Administration. (3)*spring*

Administrative organizations, economics of airline administration, operational structure, and relationship with federal government agencies. Prerequisites: AMT 308; instructor approval.

AMT 491 Aviation Management Capstone. (3)*spring*

Integration and overview of management tools, current business problems and topics related to aviation industry. Group project with industry and government and business partners. Prerequisite: senior standing.

AMT 494 Special Topics. (1–4)*not regularly offered***AMT 496 Airline Aircraft Systems Capstone. (3)***spring*

Commercial airline aircraft systems and flight procedures. Includes theoretical education for large, commercial passenger aircraft. Lecture, lab. Prerequisite: senior standing.

AMT 498 Pro-Seminar. (1–7)*not regularly offered***AMT 499 Individualized Instruction. (1–3)***not regularly offered***AMT 521 Air Transportation Regulation. (3)***not regularly offered*

Reviews evolutionary history of government regulations. Explores alternatives for economic, safety, social, and administrative regulatory reform in air transportation. Prerequisite: AMT 444 or 489 (or its equivalent).

AMT 523 Aviation Systems Management. (3)*not regularly offered*

Systems theory applied to intermodal transportation networks. Survey of air and ground transportation infrastructure, institutional frameworks, and intermediaries promoting connections between modes. Prerequisite: AMT 444 or 489 (or its equivalent).

AMT 525 Airport Planning and Design. (3)*not regularly offered*

Students complete various phases of airport master planning process. Provides guidance for logical and timely development of airports. Project work groups assigned. Prerequisite: AMT 444 or 489 (or its equivalent).

AMT 527 Airline Management Strategies. (3)*not regularly offered*

Since deregulation, airlines have undergone profound changes through mergers, consolidation, and acquisition. In-depth look at airline management strategies for the 21st century. Prerequisite: AMT 444 or 489 (or its equivalent).

AMT 528 International Aviation. (3)*not regularly offered*

Major issues of international aviation, historical review of institutional framework. Bilateral route agreements, freedom versus sovereignty, current legal and political arrangements. Prerequisite: AMT 444 or 489 (or its equivalent).

AMT 529 Fixed-Base Operations Management. (3)*not regularly offered*

Examination of FBO role in the national aviation system. Organization of flight line operations, aircraft maintenance, and administration for multiple aircraft types. Prerequisite: AMT 444 or 489 (or its equivalent).

AMT 541 Aviation Physiology. (3)*not regularly offered*

Survey of human physiology and human performance principles related to modern aircraft and aircraft systems operating in multiple environments. Prerequisite: AMT 410 (or its equivalent).

AMT 543 Ergonomics in High-Technology Environments. (3)*not regularly offered*

Examination of ergonomic design principles regarding man-machine interface requirements of high-technology workstations. Emphasis on computer workstation design issues. Prerequisite: AMT 410 (or its equivalent).

AMT 545 Human Factors in Aviation. (3)*not regularly offered*

Overview of human role in aviation. Issues, problems of unsafe acts and attitudes in human behavior. Human engineering capabilities and limitations. Prerequisite: AMT 410 (or its equivalent).

AMT 546 Crew Resource Management/Line-Oriented Flight Training. (3)*not regularly offered*

Evaluation of in-depth, multicrew coordination issues for commercial aviation pilots. Stresses importance of critical thinking, decision making, integrated resource utilization. Prerequisite: AMT 410 (or its equivalent).

AMT 547 Modern Human Factors Design Issues. (3)*not regularly offered*

Research and discussion of current human factors issues. State-of-the-art analyses of information regarding rapidly evolving designs and applications. Prerequisite: AMT 410 (or its equivalent).

AMT 549 Human Factors Research. (3)*not regularly offered*

Aviation human factors research principles applied and tested in operational settings. Group projects assigned in conjunction with industry partners. Prerequisite: AMT 410 (or its equivalent).

AMT 580 Practicum. (1-12)*not regularly offered***AMT 584 Internship. (1-12)***not regularly offered***AMT 590 Reading and Conference. (1-12)***not regularly offered***AMT 591 Seminar. (1-12)***not regularly offered***AMT 592 Research. (1-12)***not regularly offered***AMT 593 Applied Project. (1-12)***not regularly offered***AMT 595 Continuing Registration. (1)***not regularly offered***AMT 598 Special Topics. (1-4)***not regularly offered***AMT 599 Thesis. (1-12)***not regularly offered*

Department of Electronics and Computer Engineering Technology

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PROFESSORS

LINDQUIST, McHENRY, MUNUKUTLA, NOWLIN

ASSOCIATE PROFESSORSABUELYAMAN, MACIA, MILLARD,
SUNDARARAJAN, ZENG**ASSISTANT PROFESSORS**

LIPARI, PETERSON

PURPOSE

The Department of Electronics and Computer Engineering Technology prepares graduates to apply scientific and engineering knowledge, methods, and techniques in support of technological applications in electronics and computer engineering activities and processes.

The engineering technology curriculum is applications oriented and builds upon a background of applied science and mathematics, including the concepts and applications of calculus. Graduates are prepared to produce practical, workable, and safe solutions to technologically challenging problems. Graduates are employed in the electronics and computer industries with responsibilities such as designing, installing and operating technical systems, analyzing and (re) engineering systems that embed computer hardware and software for unique applications, developing and producing products, managing manufacturing processes, and providing customer support for technical products and systems.

DEGREES

The faculty in the Department of Electronics and Computer Engineering Technology offer the B.S. degree in Electronics Engineering Technology (B.S./EET) and the B.S. degree in Computer Engineering Technology (B.S./CET).

For students holding an A.A.S. degree, the department offers the B.A.S. degree with a major in Applied Science. Five concentrations are available: computer systems administration, instrumentation, microcomputer systems, semiconductor technology, and software technology applications.

A Master of Science in Technology degree program with concentrations in electronics engineering technology, computer systems engineering technology, instrumentation and measurement technology, and microelectronics engineering technology is available for qualified B.S. graduates. See the *Graduate Catalog* for more information.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

Electronics Engineering Technology—B.S.

Students interested in the B.S. degree in Electronics Engineering Technology may choose to specialize in one of the following three concentrations: electronic systems, microelectronics, and telecommunications.

The *electronic systems* concentration is aimed at preparing persons for careers in control, electronics, instrumentation, and power systems applications. This concentration allows a student to develop a broad-based knowledge of electrical/electronic fundamentals with an applications perspective.

The *microelectronics (UET)* concentration combines applied electronics, monolithic and hybrid integrated circuit processing and applications, device and component fabrication, and manufacturing. The objective of this concentration is to prepare persons to assume positions in the area of microelectronics manufacturing with immediately applicable knowledge as well as to develop a strong foundation of electronic fundamentals and methods. Graduates of this concentration secure positions in processing, manufacturing operations, and applications areas in industry as members of the diverse scientific engineering team.

The *telecommunications* concentration encompasses the fundamentals of information and signal processing, modern bandwidth-efficient digital radio analysis with RF and microwave circuits and systems. Applications include telephone pulse code modulation, cable TV, fiber optic links, and satellite transmission circuits and systems.

The departmental curriculum is organized into two categories, technical studies and General Studies. Technical studies consist of core areas and the concentration specialty area. General Studies consist of courses selected to meet the university General Studies requirement (see "General Studies," page 78) as well as the math/science requirement of TAC of ABET. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses.

A minimum of 50 upper-division hours is required, including at least 24 semester hours of EET, CET, or UET upper-division hours to be taken at ASU. A minimum of 128 semester hours with a 2.00 cumulative GPA is required for graduation. Complete program of study guides with typical four-year patterns are available from the department.

The General Studies portion of the B.S./EET curriculum has been carefully structured to meet the specific requirements of the university and to include the content required by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, the professional accrediting agency for such curricula.

ELECTRONICS ENGINEERING TECHNOLOGY— B.S. DEGREE REQUIREMENTS

In addition to the courses listed for First-Year Composition and university General Studies, the following courses are required.

ENGINEERING TECHNOLOGY CORE

The following courses are required as part of the engineering technology core:

ETC 100 Languages of Technology <i>CS</i>	4
ETC 211 Applied Engineering Mechanics: Statics	3

ETC 340 Applied Thermodynamics and Heat Transfer	3
Total	10

Electronics Engineering Technology Core and Major Requirements

CET 150 Digital Systems I <i>CS</i>	4
CET 256 C Programming for Engineering Technology	3
CET 350 Digital Systems II	4
CET 354 Microcomputer Architecture and Programming	4
EET 208 Electric Circuit Analysis I	4
EET 301 Electric Circuit Analysis II	4
EET 310 Electronic Circuits I	4
EET 372 Communication Systems	4
EET 396 Professional Orientation*	1
EET 407 Energy Conversion and Applications	4
EET 410 Electronic Circuits II	3
UET 331 Electronic Materials	3
UET 415 Electronic Manufacturing Engineering Principles	3
Total	45

* Students must take EET 396 the semester in which they are enrolled in the 87th hour of credit (ASU plus transfer hours). If this occurs in summer session, students should take EET 396 the prior spring semester.

Electronics Engineering Technology Concentrations

Electronic Systems

CET 483 UNIX with C Applications	3
EET 406 Control System Technology	4
EET 430 Instrumentation Systems	4
EET 460 Power Electronics	4
Approved technical electives	8
Total	23

Microelectronics

CHM 116 General Chemistry <i>SQ</i>	4
UET 416 Monolithic Integrated Circuit Devices	3
UET 417 Monolithic Integrated Circuit Laboratory	2
UET 418 Hybrid Integrated Circuit Technology	4
UET 421 Applied Device Physics	3
UET 432 Semiconductor Packaging and Heat Transfer	3
Approved technical electives	4
Total	23

Telecommunications

CET 473 Digital/Data Communications	4
EET 304 Microwave Technology	4
EET 401 Digital Filters and Applications	3
EET 470 Communication Circuits	4
Approved technical electives	8
Total	23

Electronics Engineering Technology Program of Study Typical First- and Second-Year Sequence First Year

First Semester

CET 150 Digital Systems I <i>CS</i>	4
ENG 101 First-Year Composition	3
MAT 170 Precalculus <i>MA</i>	3
PHY 111 General Physics <i>SQ</i> ¹	3
PHY 113 General Physics Laboratory <i>SQ</i> ¹	1
Total	14

Second Semester

ENG 102	First-Year Composition	3
ETC 100	Languages of Technology <i>CS</i>	4
MAT 260	Technical Calculus I <i>MA</i>	3
PHY 112	General Physics <i>SQ</i> ²	3
PHY 114	General Physics Laboratory <i>SQ</i> ²	1
HU, SB, or awareness area course		3
Total		17

Second Year

First Semester

CET 256	C Programming for Engineering Technology	3
CHM 113	General Chemistry <i>SQ</i>	4
ECN 111	Macroeconomic Principles <i>SB</i>	3
EET 208	Electric Circuit Analysis I	4
MAT 261	Technical Calculus II <i>MA</i>	3
Total		17

Second Semester

EET 301	Electric Circuit Analysis II	4
ETC 211	Applied Engineering Mechanics: Statics	3
MAT 262	Technical Calculus III <i>MA</i>	3
L1 course		3
HU, SB, or awareness area course		3
Total		16

¹ Both PHY 111 and 113 must be taken to secure SQ credit.

² Both PHY 112 and 114 must be taken to secure SQ credit.

**COMPUTER ENGINEERING TECHNOLOGY—
B.S. DEGREE REQUIREMENTS**

Students interested in the B.S. degree in Computer Engineering Technology (B.S./CET) may choose to specialize in one of the following three concentrations: computer hardware technology, embedded systems technology, and software technology.

The *computer hardware technology* concentration is designed to provide students with an opportunity to develop broad-based knowledge and skills in digital systems, interfacing techniques and computer hardware applications.

The *embedded systems technology* concentration prepares students for the application, interconnection, design, analysis, and realization of systems that involve both software and hardware components. This concentration balances the hardware concerns of computer engineering with the processes and technologies involved in producing reliable software solutions.

The *software technology* concentration prepares students for careers in software applications in the context of an industry in which software solutions are increasingly distributed, using object-oriented languages and frameworks, and in which the Internet, Web and wireless technologies play an important role.

Each student must satisfy the courses listed for First-Year Composition and the university General Studies requirement. In addition, the following courses are required.

Lower-Division Core

CET 100	Object-Oriented Software Development I	3
CET 150	Digital Systems I <i>CS</i>	4
CET 230	Applied Data Structures	3

CET 256	C Programming for Engineering Technology	3
EET 208	Electric Circuit Analysis I	4
ETC 100	Languages of Technology <i>CS</i>	4
Core total		21

Major

CET 350	Digital Systems II	4
CET 354	Microcomputer Architecture and Programming	4
CET 456	Assembly Language Applications	3
CET 483	UNIX with C Applications	3
CET 486	Hardware Description Languages: VHDL	3
CET 494	ST: Computer Project	3
EET 396	Professional Orientation	1
Total		21

Computer Hardware Technology Concentration

CET 452	Digital Logic Applications	4
CET 454	Microcontrollers	3
CET 457	Microcomputer Systems Interfacing	4
CET 473	Digital/Data Communications	4
CHM 113	General Chemistry <i>SQ</i>	4
EET 301	Electric Circuit Analysis II	4
EET 310	Electronic Circuits I	4
EET 372	Communication Systems	4
UET 331	Electronic Materials	3
Technical electives		5
Total		39

Embedded Systems Technology Concentration

CET 200	Object-Oriented Software Development II	3
CET 300	Object-Oriented Software Development III	3
CET 386	Operating Systems Principles	3
CET 452	Digital Logic Applications	4
CET 457	Microcomputer Systems Interfacing	4
CET 473	Digital/Data Communications	4
CET 488	UNIX Systems Administration	3
CHM 113	General Chemistry <i>SQ</i>	4
EET 301	Electric Circuit Analysis II	4
Technical electives		7
Total		39

Software Technology Concentration

CET 200	Object-Oriented Software Development II	3
CET 236	Introduction to Visual BASIC	3
CET 300	Object-Oriented Software Development III	3
CET 326	Modern Programming Languages	3
CET 386	Operating Systems Principles	3
CET 400	Software Engineering Technology	3
CET 425	Server Software Programming	3
CET 488	UNIX Systems Administration	3
CET 489	Network Programming	3
Technical electives		12
Total		39

**Computer Engineering Technology
Program of Study
Typical First- and Second-Year Sequence
First Year**

First Semester

CET 100	Object-Oriented Software Development I	3
ENG 101	First-Year Composition	3
MAT 170	Precalculus <i>MA</i>	3
PHY 111	General Physics <i>SQ</i> ¹	3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

PHY 113 General Physics Lab <i>SQ</i> ¹	1
Total	13

Second Semester

CET 200 Object-Oriented Software Development II	3
ENG 102 First-Year Composition.....	3
ETC 100 Languages of Technology <i>CS</i>	4
MAT 260 Technical Calculus I <i>MA</i>	3
PHY 112 General Physics <i>SQ</i> ²	3
PHY 114 General Physics Lab <i>SQ</i> ²	1
Total	17

Second Year**First Semester**

CET 150 Digital Systems <i>CS</i>	4
CET 230 Applied Data Structures.....	3
CET 256 C Programming for Engineering Technology.....	3
CHM 113 General Chemistry <i>SQ</i>	4
MAT 261 Technical Calculus II	3
Total	17

Second Semester

CET 300 Object-Oriented Software Development III.....	3
CET 350 Digital Systems II	4
ECN 111 Macroeconomic Principles <i>SB</i>	3
EET 208 Electric Circuit Analysis I.....	4
MAT 243 Discrete Mathematical Structures	3
or MAT 262 Technical Calculus III <i>MA</i> (3)	
Total	17

¹ Both PHY 111 and 113 must be taken to secure *SQ* credit.

² Both PHY 112 and 114 must be taken to secure *SQ* credit.

APPLIED SCIENCE—B.A.S.

The Bachelor of Applied Science degree is a “capstone” degree for the Associate of Applied Science degree. The B.A.S. degree exposes students to advanced concepts and diverse critical thinking skills that prepare them for future career opportunities and professional advancement.

Admission

Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and a 2.50 for nonresident applicants.

Degree Requirements

The B.A.S. degree in the College of Technology and Applied Sciences consists of 60 semester hours of upper-division (300-level and above) courses, with 30 hours in residence.

A.A.S. degree transfer.....	60
Assignable credit.....	6
B.A.S. core.....	15
General Studies	19
Technical concentration	20
Total	120

General Studies Curriculum

The B.A.S. curriculum builds on the general education content of the A.A.S. degree. Additional General Studies (L, CS and awareness areas) are met with courses in the core or

concentration. General Studies courses focus on contextual learning.

L	3
MA	3
HU	3
HU or SB	3
SB	3
SG	4
Total	19

Assignable Credit

Assignable credit allows space in the curriculum for pre-requisite courses needed to succeed in the program. The courses are determined by the student and the advisor.

B.A.S. Core

The area core focuses on management and organization, professional communication, quantitative analysis, and computer competency.

CET 300 Object-Oriented Software Development III.....	3
EET 494 ST: Data Analysis.....	3
GIT 352 Technical Presentations and Visual Literacy.....	3
IMC 346 Management Dynamics	3
TWC 400 Technical Communication <i>L</i>	3
Total	15

Technical Concentrations

Computer Systems Administration. This concentration is designed to broaden and provide more in-depth knowledge in computer networks. Graduates from this concentration will be prepared to specify, install, maintain, and administer various computer networking systems.

Instrumentation. This concentration studies instrumentation, power systems, and computer systems. The curriculum prepares the graduate to specify and prepare solutions for a wide variety of electrical and electronic instrumentation systems. Graduates from this concentration are primed for technical leadership positions in the various segments of the electronics industry.

Microcomputer Systems. This concentration prepares graduates for product specification and marketing positions in microcomputer applications. The B.A.S. degree provides additional technical skills in microcomputer systems to prepare graduates for responsible and productive positions in the support of computer systems.

Semiconductor Technology. This concentration prepares graduates for careers in the semiconductor industry. The B.A.S. degree provides graduates with an understanding of integrated circuit processing, mask making, packaging, and the software tools used in this industry.

Software Technology Applications. This concentration prepares graduates for careers in the software industry. The B.A.S. degree furnishes additional technical expertise in software technology to prepare graduates to design, specify, and provide software solutions for industry and the consumer market. This concentration also prepares graduates for computer systems and network administration careers.

COMPUTER ENGINEERING TECHNOLOGY (CET)**CET 100 C/C++ Programming. (3)***fall and spring*

Applied and practical problem solving using the C programming language. Introduction to C++. Prerequisite: ETC 100.

CET 150 Digital Systems I. (4)*fall and spring*

Number systems, Boolean algebra, combinational logic, K-maps, flip-flops, sequential circuits, state machines, and minimization techniques.

*General Studies: CS***CET 191 First-Year Seminar. (1–3)***not regularly offered***CET 200 JAVA Programming. (3)***fall*

Concepts of JAVA programming language addressing advanced topics such as JAVA archive files, threads, inheritance, dialog boxes, and JAVA beans. Prerequisite: CET 100.

CET 230 Applied Data Structures. (3)*fall*

Introduction to data structures: strings, stacks, queues, binary trees, recursion, searching, and sorting. Prerequisite: CET 100.

CET 236 Introduction to Visual BASIC. (3)*fall*

Introduction to BASIC and programming in the Visual BASIC environment. Prerequisite: CET 100.

CET 250 Computer and Network Technology. (3)*spring*

Computer technology as related to digital communications and networking. Network operating systems, protocols, and routing technology. Prerequisite: CET 100, 150.

CET 256 C Programming for Engineering Technology. (3)*fall, spring, summer*

Applied and practical problem solving using the C programming language. Prerequisite: ETC 100.

CET 294 Special Topics. (1–4)*not regularly offered***CET 300 Object-Oriented Software Development. (3)***fall*

Increases skills in OO concepts and present C++. Covers JAVA concepts of threads, serialization, and JAVA beans. C++ language concepts. Prerequisites: CET 200, 256.

CET 326 Modern Programming Languages. (3)*fall*

Concepts and semantical and syntactical construction of modern programming languages. Prerequisite: CET 200.

CET 350 Digital Systems II. (4)*fall*

Analysis and design of synchronous and asynchronous state machines. Introduction to VHDL. Lecture, lab. Prerequisite: CET 150.

CET 354 Microcomputer Architecture and Programming. (4)*fall and spring*

Microcomputer architecture, assembly language programming, I/O considerations, exception and interrupt handling. Introduction to interfacing. Prerequisite: CET 150.

CET 386 Operating Systems Principles. (3)*spring*

Fundamentals of operating systems, process management, scheduling and synchronization techniques, memory and file management, protection and security issues. Prerequisite: CET 256.

CET 400 Software Engineering Technology. (3)*spring*

Software life-cycle models; project management; team development environments; software specification, design, implementation techniques and tools, validation, and maintenance; user documentation. Prerequisite: senior standing in Technology.

CET 401 Digital Signal Processing for Multimedia. (3)*fall*

Application of DSP techniques to multimedia. Digital filter analysis and design. Time and frequency techniques. Computer applications. Cross-listed as EET 401. Credit is allowed for only CET 401 or EET 401. Prerequisites: EET 301; MAT 262.

CET 425 Server Software Programming. (3)*once a year*

Design and implementation of software servers, threaded socket servers, servers for distributed Web-based applications; security for the Web. Prerequisite: CET 300 or instructor approval.

CET 426 Software Tools for the Semiconductor Industry. (3)*spring*

Introduction to software tools commonly used in the semiconductor industry, such as SUPREM IV, PSPICE, VIEWLOGIC, and ICED. Cross-listed as UET 426. Credit is allowed for only CET 426 or UET 426. Prerequisite: UET 331.

CET 433 Database Technology. (3)*fall*

Introduction to database technologies and DBMS, data models, and languages. Prerequisites: CET 230, 300.

CET 436 Applications of Visual BASIC. (3)*fall*

Applications of Visual BASIC to graphics, graphical user interfaces, error handling, file processing, OO programming, DBMS, networking, and multimedia. Prerequisite: CET 236.

CET 450 Advanced Internetworking Technologies. (3)*spring*

Effects and benefits, design and functions of internetworking protocols. Prepares students for the Cisco certification examination. Prerequisite: CET 250.

CET 452 Digital Logic Applications. (4)*spring*

Design of sequential machines using system design techniques and complex MSI/LSI devices with lab. Prerequisite: CET 350.

CET 454 Microcontrollers. (3)*spring*

Microcontroller input/output ports and advanced features. Microcontrollers as an embedded system and their interfacing considerations. Prerequisites: CET 350, 354.

CET 456 Assembly Language Applications. (3)*fall*

Programming using BIOS and DOS routines. High-level language interfacing. Disk operations, TSR routines, and device drivers. Prerequisite: CET 354.

CET 457 Microcomputer Systems Interfacing. (4)*spring*

Applications of microcomputer hardware and software. Special purpose controllers, interface design. Lecture, lab. Prerequisites: CET 354; CSE 183; EET 310.

CET 458 Digital Computer Networks. (3)*once a year*

Network technology, topologies, protocols, control techniques, reliability, and security. Prerequisite: CET 354.

CET 473 Digital/Data Communications. (4)*fall*

Signals, distortion, noise, and error detection/correction. Transmission and systems design. Interface techniques and standards. Lecture, lab. Prerequisites: CET 354; EET 372.

CET 483 UNIX with C Applications. (3)*fall*

Generate user proficiency in the use of the UNIX operating system, its shells, environment, and 4th generation language and tools. Prerequisite: senior standing in the ECET department (or its equivalent).

CET 484 Internship. (1–12)*not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

CET 485 Digital Testing Techniques I. (3)*once a year*

Hardware/software aspects of digital testing technology; systems, board, and logic testing and equipment. Lecture, lab. Cross-listed as UET 485. Credit is allowed for only CET 485 or UET 485. Prerequisites: CET 350; EET 310.

CET 486 Hardware Description Languages: VHDL. (3)*spring*

Introduction to hardware description languages using VHDL. Techniques for modeling and simulating small digital systems using a VHDL simulator. Prerequisites: CET 350, 483.

CET 487 Hardware Description Languages: VERILOG. (3)*fall*

Introduction to hardware description languages, digital modeling, and simulation techniques using the VERILOG HDL. Prerequisites: CET 350, 354.

CET 488 UNIX Systems Administration. (3)*fall*

Generate user proficiency in administration of UNIX operating system, its processes, system calls, kernel, file structure, and interprocess communication tools. Prerequisites: CET 483 (or its equivalent); C or C++ language.

CET 489 Network Programming Applications. (3)*fall*

Generate user proficiency in writing C programs and scripts to control and administer a UNIX operating system network. Prerequisites: CET 473 and 488 (or their equivalents); C or C++ language.

CET 490 Reading and Conference. (1–12)*not regularly offered***CET 492 Honors Directed Study. (1–6)***not regularly offered***CET 493 Honors Thesis. (1–6)***not regularly offered***CET 494 Special Topics. (1–4)***not regularly offered*

Possible topics:

(a) Computer Project

CET 498 Pro-Seminar. (1–7)*not regularly offered***CET 499 Individualized Instruction. (1–3)***not regularly offered***CET 501 Digital Signal Processing Applications. (3)***fall*

Application of DSP techniques to the design and analysis of digital filters. Solution of filtering problems using computer techniques. Cross-listed as EET 501. Credit is allowed for only CET 501 or EET 501. Prerequisite: EET 401 or instructor approval.

CET 520 Computer Architecture. (3)*fall*

Basics of computer architecture. RTN, RISC, CISC concepts; computer arithmetic; ALUs; memory systems; I/O. Prerequisite: CET 354.

CET 533 Database Management Systems. (3)*fall*

Systems aspects of relational databases: relational database design, index and access structures, implementation and performance evaluation, query processing and optimization. Prerequisite: CET 433.

CET 546 Computer Vision. (3)*spring*

Image segmentation and enhancement. Object recognition and modeling. Morphological operation for object recognition and measurement. Prerequisite: CET 300.

CET 552 Digital Systems Design. (3)*spring*

Digital system design techniques and applications. Prerequisite: CET 452 or instructor approval.

CET 554 Distributed Computing. (3)*spring*

Topics in distributed systems, including communications, distributed operating systems, fault-tolerance, and performance issues. Prerequisites: CET 354, 386.

CET 556 Windows Programming. (3)*fall*

Programming techniques in the MS Windows and X Window environments. Prerequisite: CET 256 (or its equivalent).

CET 557 Microcomputers and Applications. (3)*fall*

Applications of small computer systems, mini- and microcomputer hardware and software. Prerequisites: CET 354; CSE 100 (or 183); EET 310.

CET 566 Principles and Practices of Operating Systems. (3)*spring*

Principles and practices of operating systems: virtual memory systems, I/O devices and systems, file systems and organization, and other topics. Prerequisite: CET 386.

CET 576 Embedded Real-Time Programming. (3)*fall*

Topics in real-time embedded operating systems such as synchronization, communications, file systems, and memory sharing. Prerequisites: CET 300, 386.

CET 580 Practicum. (1–12)*not regularly offered***CET 583 Network Programming. (3)***fall*

Generate user proficiency in writing C programs and scripts to control and administer a UNIX operating system network. Prerequisites: CET 473 and 488 (or their equivalents); C or C++ language.

CET 584 Internship. (1–12)*not regularly offered***CET 585 Digital Testing Techniques II. (3)***fall*

Testing technology as applied to digital systems, boards, and chips. Lecture, lab. Prerequisite: CET 354.

CET 586 Digital Modeling Techniques. (3)*spring*

Digital system modeling and simulation using hardware description languages. Prerequisites: CET 350, 354.

CET 590 Reading and Conference. (1–12)*not regularly offered***CET 591 Seminar. (1–12)***not regularly offered***CET 592 Research. (1–12)***not regularly offered***CET 593 Applied Project. (1–12)***not regularly offered***CET 594 Conference and Workshop. (1–12)***not regularly offered***CET 595 Continuing Registration. (1)***not regularly offered***CET 598 Special Topics. (1–4)***not regularly offered***CET 599 Thesis. (1–12)***not regularly offered***ELECTRONICS ENGINEERING TECHNOLOGY (EET)****EET 191 First-Year Seminar. (1–3)***not regularly offered***EET 208 Electric Circuit Analysis I. (4)***fall and spring*

Electrical models, AC/DC steady-state analysis of first and second order systems. Circuit theorems. Three-phase circuits. Lecture, lab. Pre- or corequisite: MAT 261.

EET 294 Special Topics. (1–4)*not regularly offered***EET 301 Electric Circuit Analysis II. (4)***fall and spring*

Analysis of continuous-time signals and linear systems of using Laplace and Fourier response of circuits. Lecture, lab. Prerequisite: EET 208. Pre- or corequisite: MAT 262.

EET 304 Transmission Lines in Computer Engineering. (3)*spring*

Transmission line considerations for computer circuits. Reflection, transients, cross talk, and other topics. High-speed circuit considerations. Prerequisite: EET 301.

EET 310 Electronic Circuits I. (4)*fall and spring*

Multistage amplifier, analysis, and design using models and computer simulation. Lecture, lab. Prerequisite: EET 208.

EET 372 Communication Systems. (4)*fall and spring*

Systems analysis and design of AM, FM, PCM, and SSB communication systems. Noise and distortion performance of communication systems. Lecture, lab. Pre- or corequisites: EET 301, 310.

EET 394 Special Topics. (1–4)*not regularly offered***EET 396 Professional Orientation. (1)***fall and spring*

Technical, professional, economic, and ethical aspects of electronics/computer engineering technology practice and industrial organization. Lecture, projects. Prerequisite: junior standing.

EET 401 Digital Signal Processing for Multimedia. (3)*fall*

Application of DSP techniques to multimedia. Digital filter analysis and design. Time and frequency techniques. Computer applications. Cross-listed as CET 401. Credit is allowed for only CET 401 or EET 401. Prerequisites: EET 301; MAT 262.

EET 406 Control System Technology. (4)*spring*

Control system components, analysis of feedback control systems, stability, performance, and application. Lecture, lab, computer simulations. Prerequisites: EET 301; MAT 262.

EET 407 Energy Conversion and Applications. (4)*fall*

Electricity, magnetism, mechanics, heat and units, and three-phase circuits. Electrical machines, transformers, generation, transmission, and distribution of electrical energy. Lecture, lab. Prerequisite: EET 208.

EET 410 Electronic Circuits II. (3)*fall and spring*

Analysis and design of OP-amps, power amplifiers, and digital logic families. Feedback design using frequency response. Computer analysis and design. Prerequisites: EET 301, 310.

EET 422 Electronic Switching Circuits. (4)*once a year*

Analysis and design of electronic circuits operating in a switching mode. Waveshaping, timing, and logic. Computer simulation. Lecture, lab. Prerequisites: CET 350; EET 301, 310.

EET 430 Instrumentation Systems. (4)*fall*

Measurement principles and instrumentation, techniques. Signal and error analysis. Lecture, lab. Prerequisites: EET 301, 310.

EET 460 Power Electronics. (4)*spring*

Analysis of circuits for control and conversion of electrical power and energy. Lecture, lab. Prerequisites: EET 301, 310, 407.

EET 470 Communication Circuits. (4)*spring*

Analysis and design of passive and active communication circuits. Coupling networks, filters, and impedance matching. Modulation and demodulation techniques. Computer solutions. Lecture, lab. Prerequisites: EET 372; MAT 262.

EET 478 Fiber Optic Communications. (3)*spring*

Fiber optic communication systems analysis and design. Study of fiber optic waveguides, light sources, light detectors, noisy light signal detection. Prerequisites: EET 372; MAT 262.

EET 482 Industrial Practice: Internship/Co-op. (1–4)*fall, spring, summer*

Specially assigned or approved activities in electronic industries or institutions. Report required. May be repeated for up to a maximum of 10 credits. Prerequisites: Electronics Engineering Technology major; junior or senior standing.

EET 484 Internship. (1–12)*not regularly offered***EET 490 Electronics Project. (1–4)***fall, spring, summer*

Individual or small group projects in applied electronics, with emphasis on laboratory practice or hardware solutions to practical problems. Prerequisite: instructor approval.

EET 492 Honors Directed Study. (1–6)*not regularly offered***EET 493 Honors Thesis. (1–6)***not regularly offered***EET 494 Special Topics. (1–4)***fall and spring*

Possible topics:

(a) Data Analysis. (3)

EET 498 Pro-Seminar. (1–7)*not regularly offered***EET 499 Individualized Instruction. (1–3)***not regularly offered***EET 500 Research/Writing. (2)***fall and spring*

Designed to help master's students develop their projects and write the first three chapters of their projects. Lecture, seminar. Prerequisite: instructor approval.

EET 501 Digital Signal Processing Applications. (3)*fall*

Application of DSP techniques to the design and analysis of digital filters. Solution of filtering problems using computer techniques. Cross-listed as CET 501. Credit is allowed for only CET 501 or EET 501. Prerequisite: EET 401 or instructor approval.

EET 506 System Dynamics and Control. (3)*spring*

Time, frequency, and transform domain analysis of physical systems. Transfer function analysis of feedback control systems performance and stability. Compensation. Prerequisite: EET 301 or MAT 262.

EET 508 Digital Real-Time Control. (3)*once a year*

Sample data control techniques and applications to process control. Prerequisites: CET 354; EET 406.

EET 510 Linear Integrated Circuits and Applications. (3)*fall*

Analysis, design, and application of linear integrated circuits and systems. Prerequisites: CET 350; EET 301, 310.

EET 522 Digital Integrated Circuits and Applications. (3)*spring*

Analysis, design, and application of integrated circuits and systems. Prerequisites: CET 350; EET 301, 310.

EET 530 Electronic Test Systems and Applications. (3)*fall*

Analysis, design, and application of electronic test equipment, test systems, specifications, and documentation. Prerequisites: CET 354; EET 301, 310.

EET 560 Industrial Electronics and Applications. (3)*spring*

Analysis, design, and application of special electronic devices and systems to industrial control, power, communications, and processes. Prerequisites: CET 350; EET 301, 310, 407.

EET 574 Microwave Amplifier-Circuits Design. (3)*fall*

Analysis and design of microwave amplifier-circuits using s-parameter theory and computer-aided design. Prerequisites: EET 304, 470.

EET 578 Digital Filter Hardware Design. (3)*spring*

Hardware design of FIR and IIR filters, including adaptive filters, based on DSP chips. Develop new applications using DSP microprocessor systems. Prerequisites: CET 354; EET 401.

EET 579 Digital Image Communication. (3)*spring*

Image capture, transform, compression, storage, and transmission. Computer environment (software and hardware) is provided to emphasize the practical aspect. Prerequisite: EET 401 or instructor approval.

EET 580 Practicum. (1–12)*not regularly offered***EET 584 Internship. (1–12)***not regularly offered***EET 590 Reading and Conference. (1–12)***not regularly offered*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

EET 591 Graduate Seminar. (1–12)*not regularly offered***EET 592 Research. (1–12)***not regularly offered***EET 593 Applied Project. (1–12)***not regularly offered***EET 594 Conference and Workshop. (1–12)***not regularly offered***EET 595 Continuing Registration. (1)***not regularly offered***EET 598 Special Topics. (1–4)***not regularly offered***EET 599 Thesis. (1–12)***not regularly offered***MICROELECTRONICS
ENGINEERING TECHNOLOGY (UET)****UET 191 First-Year Seminar. (1–3)***not regularly offered***UET 194 Special Topics. (1–4)***not regularly offered***UET 294 Special Topics. (1–4)***not regularly offered***UET 331 Electronic Materials. (3)***fall*

Physical, chemical, electromagnetic, and mechanical properties of electronic materials. Solid-state device characteristics and their material properties. Prerequisites: CHM 113; EET 208; PHY 112, 114.

UET 411 Applied Vacuum Technology. (3)*spring*

Fundamentals, applications, and practical aspects of vacuum systems and their uses in semiconductor fabrication. Prerequisite: UET 331.

UET 415 Electronic Manufacturing Engineering Principles. (3)*fall and spring*

Electronic equipment design and fabrication principles and practice. Completion of electronics hardware design project and report. Lecture, lab. Fee. Prerequisites: senior standing (113 hours) in Electronics Engineering Technology.

UET 416 Monolithic Integrated Circuit Devices. (3)*fall*

Physics and electronics of bipolar and MOS devices used in integrated circuits. Prerequisite: UET 331. Corequisite: UET 417.

UET 417 Monolithic Integrated Circuit Laboratory. (2)*fall*

Laboratory practice in the fabrication of integrated circuits. Lab. Prerequisite: UET 331. Corequisite: UET 416.

UET 418 Hybrid Integrated Circuit Technology. (4)*spring*

Layout, fabrication, design, and manufacture of thin and thick film hybrid circuits. Lecture, lab. Prerequisites: EET 310; UET 331.

UET 421 Applied Device Physics. (3)*fall*

Band structures of solids, physics of current carriers in solids, pn junctions, MOS and bipolar transistors. Prerequisite: senior standing in the department.

UET 424 Integrated Circuit Mask-Making Technology. (3)*fall*

Fundamentals, applications, and techniques for the fabrication of integrated circuit masks. Prerequisite: UET 331.

UET 426 Software Tools for the Semiconductor Industry. (3)*spring*

Introduction to software tools commonly used in the semiconductor industry, such as SUPREM IV, PSPICE, VIEWLOGIC, and ICED. Cross-listed as CET 426. Credit is allowed for only CET 426 or UET 426. Prerequisite: UET 331.

UET 432 Semiconductor Packaging and Heat Transfer. (3)*spring*

Packaging theory and techniques; hermetic and plastic assembly; thermal management; electrical characteristics and reliability. Prerequisites: ETC 340 and UET 331 (or their equivalents).

UET 437 Integrated Circuit Testing. (3)*spring*

Principles, techniques, and strategies employed at wafer level and final product testing, both destructive and nondestructive. Prerequisite: UET 416.

UET 484 Internship. (1–12)*not regularly offered***UET 485 Digital Testing Techniques I. (3)***once a year*

Hardware/software aspects of digital testing technology; systems, board, and logic testing and equipment. Lecture, lab. Cross-listed as CET 485. Credit is allowed for only CET 485 or UET 485. Prerequisites: CET 350; EET 310.

UET 492 Honors Directed Study. (1–6)*not regularly offered***UET 493 Honors Thesis. (1–6)***not regularly offered***UET 494 Special Topics. (1–4)***not regularly offered***UET 498 Pro-Seminar. (1–7)***not regularly offered***UET 499 Individualized Instruction. (1–3)***not regularly offered***UET 513 VLSI Circuit Design and Layout. (3)***fall*

Techniques and practice for the design and layout of very large-scale integrated (VLSI) circuits. Emphasis on "system on silicon" using tools for computer-aided design layout. Seminar. Prerequisite: UET 416.

UET 516 Semiconductor Process Simulation and Integration. (3)*spring*

Modern IC processes and process integration; design of modern IC processes using SUPREM. Lecture, lab. Prerequisite: UET 416.

UET 518 Hybrid IC Technology and Applications. (3)*spring*

Theory, processing, fabrication, and manufacturing of hybrid microelectronics devices and products. Applications. Prerequisite: UET 331 (or its equivalent) or instructor approval.

UET 521 Device Physics. (3)*fall*

Band structure of solids, electron hole-pairs, mobility, lifetime, fermi-level, pn junctions, diodes, and bipolar and MOS transistors. Prerequisite: graduate standing in the department.

UET 532 IC Packaging. (3)*spring*

IC packaging theory and techniques; assembly techniques, material issues; thermal management; electrical performance and reliability. Lecture, lab. Prerequisites: ETC 340 and UET 331 (or their equivalents).

UET 580 Practicum. (1–12)*not regularly offered***UET 584 Internship. (1–12)***not regularly offered***UET 590 Reading and Conference. (1–4)***not regularly offered***UET 591 Seminar. (1–12)***not regularly offered***UET 592 Research. (1–12)***not regularly offered***UET 593 Applied Project. (1–12)***not regularly offered***UET 594 Conference and Workshop. (1–12)***not regularly offered***UET 595 Continuing Registration. (1)***not regularly offered***UET 598 Special Topics. (1–4)***not regularly offered***UET 599 Thesis. (1–12)***not regularly offered*

Department of Information and Management Technology

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PROFESSORS

DUFF, HILD, SADOWSKI, SCHILDGEN

ASSOCIATE PROFESSORS

GROSSMAN, HIRATA, HUMBLE, MATSON,
 OLSON, PETERSON

ASSISTANT PROFESSOR

KIME

SENIOR LECTURER

WILSON

LECTURERS

DOLIN, HARRIS, LESTAR

PURPOSE

The mission of the department is to prepare graduates who are able to develop and communicate technological solutions to industrial problems, to manage systems operations, to improve and evaluate products, to provide customer support, and to facilitate technology transfer in industry and government. Increased complexity and sophistication have created great demand for those individuals who possess a working knowledge of the technical phases of planning, testing, production, and fabrication of consumer and industrial products and equipment. Technology includes the application of science, systematic methods, procedures, machines, communication protocols, and materials control for the development, improvement, and implementation of state-of-the-art solutions to industrial problems.

DEGREES

The faculty in the Department of Information and Management Technology offer the B.S. degree in Industrial Technology, with concentrations in the following areas: environmental technology management, industrial technology management, and graphic information technology.

For students holding an A.A.S. degree the department offers the B.A.S. degree in Applied Science, with concentrations in digital media management, digital publishing, emergency management, fire service management, operations management technology, municipal operations management, and technical graphics.

A Master of Science in Technology degree is offered for graduate study. The department offers four concentrations for the graduate degree: environmental technology management, fire service management, graphic information technology,

and management of technology. For more information about the graduate program, see the *Graduate Catalog*.

INDUSTRIAL TECHNOLOGY—B.S.

The curriculum consists of First-Year Composition, university General Studies, and technical courses. Note that all three General Studies awareness areas are required. Consult with an advisor for an approved list of courses. The technical part of the curriculum includes a required Information and Management core, program concentration course work, and technical electives selected with approval of an advisor.

Information and Management Technology students are required to complete a minimum of 120 semester hours with a 2.00 cumulative GPA, including a minimum of 50 semester hours of upper-division courses to graduate.

Information and Management Core*

ETC 100 Languages of Technology CS	4
GIT 233 Digital Publishing	3
IMC 331 Quality Assurance	3
IMC 346 Management Dynamics	3
IMC 396 Professional Orientation.....	1
IMC 470 Project Management	3
Total	17

* These courses are for the industrial technology management and graphic information technology concentrations.

Environmental Technology Management Concentration

The environmental technology management concentration prepares graduates to manage such challenging problems in industry as regulatory compliance, hazardous materials management, pollution prevention, and international environmental standards for manufacturing. The curriculum is designed to provide a unique blend of critical scientific, technical, and management skills; degree requirements encompass the development of a broad background in the natural sciences and mathematics, social and behavioral sciences, management theory, regulatory issues, and applied sciences. The program is purposely structured to facilitate transfer students who are searching for a degree program that builds upon a strong technical background and focuses on the environmental issues faced by industry.

Certificate Program in Hazardous Materials and Waste Management

The Certificate Program in Hazardous Materials and Waste Management is designed to provide current and prospective employees of industry and government with a comprehensive and practical curriculum of study in hazardous materials management. The certificate program features instruction by ASU faculty, attorneys, and professionals who work in the specific area in which they teach. Participation in the certificate program is available in three options: a certificate program for nondegree students, a B.S. degree in Industrial Technology with a Certificate in Hazardous Materials and Waste Management, and a Master of Science in Technology degree with a Certificate in Hazardous Materials and Waste Management. Students must complete seven selected courses (five required and two electives) and earn a grade of "C" or higher to receive the certificate. Except for the introductory course, ETM 501

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Principles of Hazardous Materials and Waste Management, the remainder of the courses may be taken in any sequence.

Industrial Technology Management Concentration. The industrial technology management concentration prepares students for supervisory and administrative positions in industry, manufacturing, and public service organizations. Course work includes accounting, data analysis, economics, effective decision making, finance, international business, legal and ethical studies, marketing, operations management, and safety. Emphasis is placed on health and safety within the workplace.

The industrial technology management program may be articulated with a broad range of community college technical courses. Community college specializations in areas such as aeronautics, construction, electronics, fire science, police science, graphic information technology, hazardous materials and waste management, computer graphics, safety and health, human resource management, production management, and manufacturing may form a technical specialty area within the industrial technology management option. Consultation with an advisor is required to coordinate the course selection for transfer to this option.

Graphic Information Technology Concentration. The graphic information technology concentration prepares students for technical and management positions in the diverse graphic communication and information technology industries: digital printing and publishing; technical/digital media production; management of graphic information assets; quality assurance of graphic products; planning and evaluation of print, Internet, multimedia, and computer-based communications. This is an intensive 120-semester-hour graphic technology program of study emphasizing theory and hands-on laboratory practice. Students develop skills to plan and execute graphic solutions using visualization and sketching, engineering graphic standards, technical document design, higher-level graphic programming languages, computer drawing and illustration, multimedia and three-dimensional modeling, project management, quality assurance, and e-commerce practices. Graduates are able to present technical solutions using graphics in print and Internet publications, engineering documents, media-rich presentations, interactive training and instruction, models, and animations. Typical career opportunities include graphic operations management, sales and marketing, information technology support in graphics-related industries, graphic systems analysis, digital publishing (both print and online), and computer graphics content planning and creation.

APPLIED SCIENCE—B.A.S.

The Bachelor of Applied Science degree is a “capstone” degree for the Associate of Applied Science degree. The B.A.S. degree exposes students to advanced concepts and diverse critical thinking skills that prepare them for future career opportunities and professional advancement.

Admission

Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and a 2.50 for nonresident applicants.

Degree Requirements

The B.A.S. degree in the College of Technology and Applied Sciences consists of 60 semester hours of upper-division (300 level and above) courses, with 30 hours in residence.

A.A.S. degree transfer.....	60
Assignable credit.....	6
B.A.S. core.....	15
General Studies.....	19
Technical concentration.....	20
Total.....	120

General Studies Curriculum

The B.A.S. curriculum builds on the general education content of the A.A.S. degree. Additional General Studies (L, CS and awareness areas) are met with courses in the core or concentration. General Studies courses focus on contextual learning.

L.....	3
MA.....	3
HU.....	3
HU or SB.....	3
SB.....	3
SG.....	4
Total.....	19

Assignable Credit

Assignable credit allows space in the curriculum for prerequisite courses needed to succeed in the program. The courses are determined by the student and the advisor.

B.A.S. Core

The area core focuses on management and organization, professional communication, quantitative analysis, and computer competency.

GIT 310 Computer Graphics Programming (C++) CS.....	3
or GIT 494 ST: Computer Systems Applications (3)	
IMC 346 Management Dynamics.....	3
ITM 452 Industrial Human Resource Management.....	3
or IMC 470 Project Management (3)	
MET 401 Quality Assurance.....	3
or STP 420 Introductory Applied Statistics CS (3)	
TWC 400 Technical Communications L.....	3
Total.....	15

Technical Concentrations

Operations Management Technology. The purpose of this technical concentration is to prepare supervisors for management functions in industry, manufacturing, and public service organizations. The B.A.S. degree provides the management and supervision content required for industry and governmental agencies.

Digital Media Management. This concentration prepares graduates for technical positions in industries implementing, planning, and producing interactive communications, integrated media, and multimedia for design, training, and marketing. Prospective students with A.A.S. degrees in areas such as multimedia, printing and publishing, commercial graphics, desktop publishing, or computer illustration may be interested in pursuing a digital media management concentration.

Technical Graphics. This concentration prepares graduates for positions in industries implementing technical and engineering graphics in computer-aided design and computer integrated manufacturing. A.A.S degrees in drafting and design, computer-aided design, computer integrated manufacturing technology, mechanical technology, architectural technology, or construction technology may provide an excellent foundation for a technical graphics concentration.

Digital Publishing. This concentration prepares graduates for lead technical and entry-level management positions in the printing and publishing industry. A.A.S degrees in multimedia, printing and publishing, commercial art, desktop publishing, or computer illustration may find that this technical concentration provides excellent opportunities.

Emergency Management. The concentration prepares graduates for positions in industry, municipal departments, and government agencies. The curriculum addresses the established Federal Emergency Management Administration (FEMA) guidelines, on-site emergency response contingency planning, first responder scene management, logistical analysis, and communications protocol.

Fire Service Management. This concentration prepares graduates for positions in industry, municipal departments, and governmental agencies. The curriculum addresses services delivered by fire departments, fire service personnel development, zoning, planning, inspections, and arson investigations.

Municipal Operations Management. This concentration prepares students for supervisory and management functions within municipalities, public service organizations, or businesses that provide services to the public sector. The curriculum addresses quality assurance, ethical issues, leadership practices, operations management, project management, marketing, finance, public sector management, and organizational effectiveness.

GRAPHIC INFORMATION TECHNOLOGY (GIT)

GIT 135 Graphic Communications. (3)

fall and spring

Introduction to the technologies involved in the design, image generation, transmission, and industrial production of multiple images for consumer utilization. Lecture, lab, field trips.

GIT 194 Special Topics. (1–4)

not regularly offered

GIT 210 Creative Thinking and Design Visualization. (3)

fall and spring

Fundamental methods, concepts, and techniques of creative thinking, design visualization, and problem solving. Also includes communication, cultural, and societal influences. Lecture, lab. Prerequisite: ETC 100.

GIT 212 Computer-Aided Design and Drafting (CADD). (3)

fall and spring

CADD for product design, representation, and documentation; includes projection theory, descriptive geometry, graphics analysis, drafting standards, and precision dimensioning techniques. Lecture, lab. Prerequisite: ETC 100 (or its equivalent).

General Studies: CS

GIT 215 Introduction to Graphics Programming. (3)

fall

Introduction to analyzing, planning, and executing graphic programs using industry-standard programming tools. Lecture, lab. Prerequisite: ETC 100 (or its equivalent).

GIT 233 Digital Publishing. (3)

fall and spring

Introduction to software and hardware used for digital publishing and infographics. Lecture, lab. Pre- or corequisites: GIT 135, 210.

GIT 237 Web Content Design. (3)

spring

Introduction to design principles for visual content on the World Wide Web; raster, vector, fonts, portable documents, color palettes, file formats. Lecture, lab. Prerequisite: GIT 135 (or its equivalent). Pre- or corequisite: GIT 233.

GIT 310 Computer Graphics Programming (C++). (3)

fall and spring

Computer graphics software programming techniques in C++. 2D and 3D graphics: object-oriented programming, transformations, scaling, and database concepts. Lecture, lab. Prerequisite: ETC 100 or GIT 215.

General Studies: CS

GIT 312 3D Computer Graphics Modeling and Representation. (3)

fall

3D solid modeling applications: concepts, techniques, data structures, modeling strategies, assemblies, geometric representation. Lecture, lab. Prerequisite: GIT 212.

General Studies: CS

GIT 313 Technical Illustration and Photorealistic Rendering. (3)

fall

Computer-generated graphics for technical illustration and design presentation: axonometric and perspective drawing; shading, shadowing, materials and textures; photorealistic rendering for PostScript output. Lecture, lab. Prerequisite: GIT 212.

GIT 314 Multimedia Design, Planning, and Storyboards. (3)

spring

Creative and conceptual process of content selection, planning, designing, flowcharting, storyboarding, proposing, configuring, prototyping, and presenting multimedia projects. Lecture, lab. Prerequisite: GIT 237.

GIT 333 Printing Technology. (3)

spring

Theory and application of sheet and web press technology for offset lithography, flexography, screen process, and digital printing. Lecture, lab. Pre- or corequisite: GIT 135.

GIT 334 Image Capture and Manipulation. (3)

fall

Theory and application of image capture techniques used for all copy formats and conversion processes required for reproduction or dissemination. Lecture, lab. Prerequisite: GIT 233.

GIT 335 Graphic Systems. (3)

not regularly offered

Survey of graphic technology for private/public sectors including hardware, software, storage, networking and internet, telecommunications, and new media technologies. Lecture, lab. Prerequisite: junior standing in Information Technology (graphic information technology concentration).

GIT 337 Web Content Design. (3)

fall and spring

Introduction to design principles for visual content on the World Wide Web; raster, vector, fonts, portable documents, color palettes, file formats. Lecture, lab. Pre- or corequisite: GIT 233.

GIT 352 Technical Presentations. (3)

spring

Technologies for planning, creating, and delivering individual and group presentations. Prerequisites: ENG 102; GIT 233.

GIT 394 Special Topics. (1–4)

not regularly offered

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GIT 411 Computer Animation. (3)*fall and spring*

2D and 3D computer animation methods: project planning, scripting, storyboards, advanced modeling, lighting, materials mapping, and motion. Lecture, lab. Prerequisites: GIT 312, 334.

GIT 412 Multimedia Authoring, Scripting, and Production. (3)*fall and spring*

Production of multimedia projects using industry-standard authoring applications: project management, client considerations, and project documentation; user interface design, interactivity, media, and databases. Lecture, lab. Prerequisites: GIT 314.

GIT 413 Professional Portfolio Design and Presentation. (3)*spring*

Digital media portfolio design and production: planning, audience analysis, media selection, authoring, media formats, production, copyright considerations, marketing, and delivery. Lecture, lab. Prerequisites: GIT 314, 334.

GIT 414 Web Site Design and Internet/Web Technologies. (3)*spring*

Web site design, authoring, standards, protocols, tools, and development techniques for commercial client-sided Web-based graphic information systems. Lecture, lab. Prerequisites: GIT 334, 337.

GIT 415 Computer Graphics: Business Planning and Management. (3)*spring*

Implementation planning: feasibility and application studies; needs assessment and operational analysis techniques; organization, managerial, and technology considerations; business plan development. Lecture, lab, field trips. Prerequisite: senior standing in Information Technology (graphic information technology concentration).

GIT 417 Advanced Internet Programming. (3)*fall*

Uses industry-standard programming languages and techniques to create interactive graphic information Web sites and applications. Lecture, lab. Prerequisite: GIT 414.

GIT 432 Graphic Industry Business Practices. (3)*not regularly offered*

Business practices related to press/prepress/Web industries; trade customs, cost analysis, marketing and management approaches. Lecture, lab, field trips. Prerequisite: GIT 414.

GIT 435 Web Management and E-Commerce. (3)*not regularly offered*

Internet Web site management, security, online databases, and new E-commerce business models. Lecture, lab. Prerequisite: GIT 237. Corequisite: GIT 414.

GIT 436 Gravure Technology. (3)*spring*

In-depth study of the market profile and production sequences related to the gravure method of printing. Prerequisite: GIT 135.

GIT 437 Color Reproduction Systems. (3)*fall*

Scientific analysis for the engineering of color reproduction systems and color models used in the graphics industry. Prerequisite: GIT 334.

GIT 441 Graphic Information Systems. (3)*not regularly offered*

Graphic information systems common to the workplace: graphic user interfaces for online databases, geographic, industrial, architectural, and management applications. Lecture, lab. Prerequisite: senior standing in Information Technology (graphic information technology concentration). Pre- or corequisite: GIT 434.

GIT 450 Digital Workflow in Graphic Industries. (3)*fall*

Analysis of digital production systems for input, assembly, and output of graphic information to print and Web, including networking and job tracking. Lecture, lab. Prerequisite: GIT 334.

GIT 494 Special Topics. (1–4)*fall and spring*

Possible topics:

- (a) Computer Systems Applications. (3)

GIT 510 Computer Graphics Programming: Design, Customization, and Development. (3)*not regularly offered*

Advanced design, development, and documentation of graphic application programs. Lecture, lab.

GIT 512 Multimedia-Based Education and Training. (3)*fall*

Creative design, planning, development, documentation, and production of technology-based learning and multimedia-based education and training materials and programs. Lecture, lab. Prerequisite: GIT 412.

GIT 537 Current Issues in Quality Assurance. (3)*not regularly offered*

Directed group study of selected issues relating to quality assurance in the printing, publishing, and information industry.

GIT 538 Personnel Development for the Graphics Industry. (3)*not regularly offered*

Employee training and development specific to production and management in the graphics industry.

GIT 590 Reading and Conference. (1–12)*not regularly offered***GIT 598 Special Topics. (1–4)***not regularly offered***ENVIRONMENTAL TECHNOLOGY MANAGEMENT (ETM)****ETM 301 Environmental Management. (3)***fall*

Focuses on knowledge and skills necessary to manage environmental programs. Perspectives include regulatory, individual, corporate, and consulting. Pre- or corequisites: CHM 113; MAT 170.

ETM 302 Water and Wastewater Treatment Technology. (4)*not regularly offered*

Explores the development of treatment technologies. Addresses regulatory standards. Emphasizes theory and practice of system design, laboratory analysis standards and procedures. Lecture, lab. Pre- or corequisite: ETM 301.

ETM 303 Environmental Regulations. (3)*fall and spring*

Explores environmental laws, regulations, and directives. Addresses air, land, and water. Prerequisite: ETM 301.

ETM 360 Introduction to Emergency Management. (3)*fall*

Emergency management theories. Comprehensive emergency management. Mitigation, preparedness, response, and recovery. Post-disasters and policy formation. Current FEMA all-hazards approach.

ETM 362 Managing Natural and Technological Disasters. (3)*spring*

Federal, state, and local responses to emergencies. Management of mass casualties, evacuation, sheltering, and terrorism; declaration of emergency procedures.

ETM 363 Computer Applications in Emergency Management. (3)*spring*

Explores specific computer programs which are currently in use for contingency planning, tracking chemical inventories, and response resources. Cross-listed as FSM 363. Credit is allowed for only ETM 363 or FSM 363.

ETM 364 Toxicology and Biohazards in Emergency Management. (3)*fall*

Introduction to poisons. Dose response routes of exposure and toxicokinetics. Diseases associated with natural disasters. Clinical presentation of treatments.

ETM 401 Hazardous Waste Management. (3)*fall and spring*

Definition of hazardous waste, RCRA classification, and OSHA criteria. Overview of requirements and methods of waste management. Prerequisite: ETM 301.

ETM 402 Unit Treatment Technologies. (3)*spring*

Addresses various treatment technologies for contaminated air, water, and soil. Emphasizes design based upon medium, type of contamination, and concentration. Prerequisite: ETM 302.

ETM 406 Environmental Chemistry. (3)*fall and spring*

Examines reactions, transport, and fates of hazardous chemicals in water, soil, air, and living organisms. Prerequisites: both CHM 113 and 115 or only CHM 114; MAT 170.

ETM 407 Occupational Hygiene. (3)*spring*

Overview of occupational health hazards, including recognition, evaluation, and control. Includes regulatory status and health standards. Prerequisites: CHM 101 (or 113 or 114); MAT 170.

ETM 424 Comprehensive Emergency Management. (3)*summer*

Addresses theory and management techniques for emergency preparedness, including mitigation, preparedness, response, and recovery. Pre- or corequisite: ETM 301.

ETM 426 Environmental Issues. (3)*spring*

Explores the science and policy implications of contemporary problems that threaten the environment. Pre- or corequisites: CHM 113; MAT 170.

ETM 428 International Environmental Management. (3)*summer*

Emphasis on technological and economic pressures experienced by developing countries. Prerequisite: ETM 301.

ETM 460 Incident Management Systems and Emergency Operations Center. (3)*fall*

Covers IMS, terminology, players, and management philosophy. EOC setup, activation, operation, and termination. EOC funding and politics. Cross-listed as FSM 460. Credit is allowed for only ETM 460 or FSM 460.

ETM 461 Contingency Planning. (3)*not regularly offered*

Provides understanding of techniques for in-house or on-site planning as well as community planning.

ETM 468 Simulation and Exercising. (3)*not regularly offered*

Requirements, planning, conduct, and critique of exercises related to emergency planning. Emphasis on realism using moulage and props.

ETM 494 Special Topics. (1–4)*spring*

Possible topics:

- (a) Bioremediation. (3)
 Technical-regulatory and policy issues emanating from minetailing and animal waste. Lecture, case studies.

ETM 501 Principles of Hazardous Materials and Waste Management. (3)*fall*

Foundation for courses in curriculum. Topics include definitions of toxic and hazardous substances and wastes, RCRA classification, and OSHA criteria. Pre- or corequisites: both CHM 113 and 115 or only CHM 114.

ETM 502 Regulatory Framework for Toxic and Hazardous Substances. (3)*fall*

Examines federal, state, and local regulations for hazardous materials and wastes. Includes history and trends in regulatory development. Prerequisite: ETM 501.

ETM 503 Principles of Toxicology. (3)*spring*

Interaction of chemicals with life and environment. Mechanisms of toxic action, dose-response relationships, toxicity testing models, predictive toxicology, and epidemiology. Prerequisites: both CHM 113 and 115 or only CHM 114.

ETM 504 Technology for Storage, Treatment, and Disposal of Hazardous Materials. (3)*fall*

Current and state-of-the-art technologies and future trends for storage, treatment, and disposal of hazardous materials and waste. Prerequisites: both CHM 113 and 115 or only CHM 114; ETM 501.

ETM 505 Quantitative Analysis and Practical Laboratory Techniques. (3)*fall and spring*

EPA methodologies for sampling and analysis of soils and water. Includes quality assurance and regulatory requirements. Lab is arranged off site. Prerequisites: both CHM 113 and 115 or only CHM 114, 231; MAT 170.

ETM 506 Chemistry of Hazardous Materials. (3)*fall*

Chemistry and toxicology of hazardous chemicals. Topics include proper handling, storage, transportation, and disposal. Prerequisites: both CHM 113 and 115 or only CHM 114; MAT 170. Corequisite: CHM 231.

ETM 507 Industrial Hygiene. (3)*not regularly offered*

Emphasis on chemical hazards in industrial settings. Topics include recognizing and measuring hazards, control techniques, and regulatory standards. Prerequisites: both CHM 113 and 115 or only CHM 114; MAT 170.

ETM 522 Air Pollution and Toxic Chemicals. (3)*fall*

Examines issues in the measurement analysis and control of toxic chemicals in air pollution. Prerequisites: both CHM 113 and 115 or only CHM 114; ETM 501; MAT 170.

ETM 523 Soils and Groundwater Contamination. (3)*fall*

Theoretical and practical hydrogeology as it applies to cleaning up contamination. Investigative techniques, monitoring, risk assumptions, and assessment methodology. Prerequisites: both CHM 113 and 115 or only CHM 114; ETM 501; MAT 170.

ETM 524 Emergency Preparedness, Response, and Planning for Hazardous Materials. (3)*summer*

In-house or on-site emergency response contingency planning. Preemergency assessment, resources for cooperation, equipment requirements, and coordination with other agencies. Prerequisites: both CHM 113 and 115 or only CHM 114; ETM 501; MAT 170.

ETM 525 Risk Assessment for Hazardous Materials. (3)*spring*

Applies the risk assessment process in situations ranging from hazardous facilities regulation to toxic substances in the environment. Prerequisites: both CHM 113 and 115 or only CHM 114; ETM 501; MAT 170.

ETM 526 Current Environmental Technology Issues. (3)*fall*

In-depth study of current issues in environmental technology facing both the private and public sectors.

ETM 527 Environmental/Resources Regulations Concepts. (3)*spring*

Develops environmental regulations from common law to statutory requirements. Emphasis on Superfund, hazardous materials, toxics, and liability contracts. Pre- or corequisite: ETM 501.

ETM 591 Graduate Seminar. (1)*not regularly offered***ETM 592 Research. (1–12)***not regularly offered***ETM 598 Special Topics. (1–4)***spring*

Possible topics:

- (a) Advanced Bioremediation. (3)
 Management and policy issues related to bioremediation of minetailing and animal waste and replacement of chemical control with biological methods. Lecture, case studies.

FIRE SERVICE ADMINISTRATION (FSA)

See the *Graduate Catalog* for the FSA courses.

FIRE SERVICE MANAGEMENT (FSM)**FSM 304 Fire Personnel Management. (3)***fall*

Topics include promotion, personnel development, career and incentive systems, validation of physical requirements, managerial and supervisory procedures.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

FSM 305 Quality Emergency Services. (3)*not regularly offered*

Covers quality issues relating to services delivered by progressive fire departments. Covers management of personnel and resources during organizational change.

FSM 306 Fire Prevention Organization and Management. (3)*not regularly offered*

Examines and evaluates the techniques, procedures, programs, and agencies involved in preventing fires.

FSM 363 Computer Applications in Emergency Management. (3)*spring*

Explores specific computer programs which are currently in use for contingency planning, tracking chemical inventories, and response resources. Cross-listed as ETM 363. Credit is allowed for only ETM 363 or FSM 363.

FSM 400 Human Behavior and the Fire Threat. (3)*not regularly offered*

Proper ways of conducting post-fire interviews; emphasizes the psychological effects of communications during emergencies.

FSM 421 Political and Legal Consideration in Fire Science. (3)*spring*

Study of legal and political considerations that affect the decision making of fire service managers.

FSM 425 Fire Service Administration. (3)*fall*

Presentation of modern management and planning techniques that apply to organizing a fire department.

FSM 460 Incident Management Systems and Emergency Operations Center. (3)*fall*

Covers IMS, terminology, players, and management philosophy. EOC setup, activation, operation, and termination. EOC funding and politics. Cross-listed as ETM 460. Credit is allowed for only ETM 460 or FSM 460.

FSM 494 Special Topics. (1–4)*not regularly offered***FSM 598 Special Topics. (1–4)***not regularly offered***INFORMATION AND MANAGEMENT CORE (IMC)****IMC 233 Desktop Publishing and Infographics. (3)***fall and spring*

Introduction to software and hardware used for desktop publishing and infographics. Lecture, lab.

IMC 294 Special Topics. (1–4)*not regularly offered***IMC 331 Quality Assurance. (3)***spring*

Instrumentation and methodologies for materials testing and quality control in various manufacturing processes. Lecture, field trips.

IMC 346 Management Dynamics. (3)*fall and spring*

Management challenges and the leadership skills needed to achieve organizational objectives in the changing industrial and technical environments. Prerequisite: junior standing.

IMC 396 Professional Orientation. (1)*fall and spring*

Senior advisement, industry presentations, and career counseling.

IMC 470 Project Management. (3)*spring*

Introduction to techniques for managing small groups within larger organizations, including team building, motivating, planning, tracking activities, and computer tools. Prerequisites: ECN 111; IMC 346; ITM 344.

IMC 498 Pro-Seminar. (1–7)*not regularly offered***IMC 499 Individualized Instruction. (1–3)***not regularly offered***IMC 584 Internship. (1–3)***fall and spring***IMC 590 Reading and Conference. (1–12)***not regularly offered***IMC 592 Research. (1–12)***fall and spring***IMC 593 Applied Project. (1–12)***fall and spring***IMC 595 Continuing Registration. (1)***not regularly offered***IMC 599 Thesis. (1–12)***fall and spring***INDUSTRIAL TECHNOLOGY MANAGEMENT (ITM)****ITM 343 Occupational Safety and Ergonomics. (3)***fall*

Health and safety movement, accident theories and effects, OSHA standards and liability, safeguarding, hazards, workers' compensation, ergonomics, and safety. Prerequisite: junior standing.

ITM 344 Industrial Organization. (3)*spring*

Industrial organization concepts. Topics relate to industrial relations, governmental regulations, organizational structure, labor relations, human factors, and current industrial practices. Prerequisite: IMC 346.

ITM 345 Public Sector Management. (3)*fall and spring*

Management in government and public agencies. Includes mission, planning and organizing to provide services, human resource issues, conflict resolution, coordination. Prerequisite: junior standing.

ITM 402 Legal Issue for Technologists. (3)*fall*

American legal system and impact on technology management issues: contracts, torts, intellectual property, white collar crime, anti-trust, environmental, and employment.

ITM 405 Forecasting and Evolution of Technology. (3)*not regularly offered*

History and evolutionary nature of selected technologies, issues in the management of emerging technologies, and methods of technological forecasting. Prerequisite: IMC 346 (or its equivalent).

ITM 430 Ethical Issues in Technology. (3)*spring*

Topics in social responsibility for industrial technology and engineering. Prerequisite: IMC 346.

ITM 440 Introduction to International Business. (3)*spring*

International business principles and operations, including partnerships, trade agreements, currency issues, international sales, and cultural differences between countries. Prerequisite: IMC 346.

*General Studies: G***ITM 445 Industrial Internship. (1–10)***fall, spring, summer*

Work experience assignment in industry commensurate with student's program. Specialized instruction by industry with university supervision. Pass/fail. Prerequisites: advisor approval; junior standing; 2.50 GPA.

ITM 451 Industrial Distribution and Materials Management. (3)*not regularly offered*

Surveys topics in industrial distribution including, but not limited to, materials handling, purchasing, receiving, warehousing, traffic, inventory control, and shipping. Prerequisite: IMC 346 or ITM 343.

ITM 452 Industrial Human Resource Management. (3)*fall*

Concepts and practices of human resource management in a global industrial environment. Prerequisite: IMC 346.

ITM 453 Safety Management. (3)*not regularly offered*

Development and management of safety programs, education and training, and relationships within an organization. Prerequisite: ITM 343 or instructor approval.

ITM 455 Industrial Marketing Concepts. (3)*not regularly offered*

Customer and sales strategies for industrial organizations, including current practice and future planning. Prerequisites: ECN 111; IMC 346; junior standing.

ITM 456 Introduction to Organized Labor. (3)*spring*

Introduction to labor relations, unions, federations, collective bargaining, grievances, and labor legislation. Prerequisites: IMC 346; ITM 344.

ITM 461 Operations Management. (3)*fall*

Introduction to supervisory principles as applied to production of goods and services. Prerequisites: IMC 346; ITM 344.

ITM 480 Organizational Effectiveness. (3)*spring*

Human aspects of supervisory behavior in the industrial setting and how they influence efficiency, morale, and organizational practices. Prerequisite: IMC 346.

ITM 494 Special Topics. (1–4)*not regularly offered***ITM 501 Managerial Economics. (3)***not regularly offered*

Basic managerial economic tools and techniques applied to unique concerns of scientifically intensive firms operating in rapidly evolving industrial sectors.

ITM 502 Financial Management. (3)*not regularly offered*

Examines corporate financial and managerial accounting systems, budgeting, and financial policy, using microcomputers to analyze, forecast, and report information.

ITM 503 Marketing Management. (3)*not regularly offered*

Modern methods and industrial case studies of planning, pricing, promoting, and distributing goods and services in the global marketplace. Prerequisites: ITM 480 (or its equivalent); instructor approval.

ITM 504 Law and Ethics for Technical Professionals. (3)*not regularly offered*

Analyzes legal and ethical framework for making managerial decisions in the corporate environment of engineering- and technology-related industries.

ITM 520 Strategic Management of Technology. (3)*not regularly offered*

Analyzes entrepreneurial dynamics and technology development, methods of research and development management, new technology implementation, and start-up organization. Prerequisites: ITM 480 (or its equivalent); instructor approval.

ITM 540 International Management. (3)*not regularly offered*

Practices and procedures for effective management of multinational business organizations, including partnerships, joint ownerships, and global subsidiaries.

ITM 548 Statistical Methods for Research. (3)*not regularly offered*

Multivariate statistical techniques to analyze research data. Uses statistical software and applications. Prerequisite: STP 420 (or its equivalent).

ITM 549 Research Techniques and Applications. (3)*fall and spring*

Selection of research problems, analysis of literature, individual investigations, preparing reports, and proposal writing. Prerequisite: STP 420 (or its equivalent).

ITM 550 Industrial Training and Development. (3)*not regularly offered*

Training techniques and learning processes. Planning, developing, evaluating, and managing industrial and governmental programs. Prerequisite: ITM 480.

ITM 552 Global Management Philosophies. (3)*not regularly offered*

Analyzes and compares significant supervision philosophies developed in various industrial nations and their potential application in the United States.

ITM 560 Managerial Decision Making. (3)*fall*

Analyzes common decision-making bias and techniques to overcome them. Uses both subjective quantitative decision tools and computerized decision aids.

ITM 570 Advanced Project Management. (3)*spring*

Planning, organizing, coordinating, and controlling staff and project groups to accomplish the project objective.

ITM 593 Applied Project. (1–12)*not regularly offered***ITM 598 Special Topics. (1–4)***not regularly offered*

Possible topics:

(a) Quantitative Research Analysis

Department of Manufacturing and Aeronautical Engineering Technology

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PROFESSOR
COLLINS

ASSOCIATE PROFESSORS

DANIELSON, NAM, PALMGREN, RAJADAS,
ROGERS, SCHMIDT

ASSISTANT PROFESSOR
POST

PURPOSE

The mission of the Department of Manufacturing and Aeronautical Engineering Technology is to emphasize applied engineering practice in the manufacturing and aerospace fields through four-year degree programs in Manufacturing Engineering Technology and Aeronautical Engineering Technology. This is accomplished by the application of math and science principles to the solution of technical problems in a lecture/laboratory environment. The goal of the Manufacturing Engineering Technology program is to prepare students for employment in areas such as materials, mechanics, design, manufacturing processes, automation, and quality control. The department actively supports the student chapter of the Society of Manufacturing Engineers. The purpose of the Aeronautical Engineering Technology program is to prepare students for employment in areas such as aircraft and aerospace vehicle design, and manufacturing, applied thermodynamics, fluid mechanics and aerodynamics, propulsion, and wind tunnel testing. For more information, access www.east.asu.edu/ctas/maet on the Web.

ACCREDITATION

The B.S. degree in Manufacturing Engineering Technology and the B.S. degree in Aeronautical Engineering Technology are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (See "Accreditation," page 633, for more information.)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

DEGREES

The Department of Manufacturing and Aeronautical Engineering Technology offers the B.S. degree in Manufacturing Engineering Technology and the B.S. degree in Aeronautical Engineering Technology.

For students holding an A.A.S. degree, the department offers the B.A.S. degree with a concentration in production technology.

A Master of Science in Technology degree is offered for graduate study. See the *Graduate Catalog* for more information.

B.S. Degree Requirements

All degree requirements for the program are shown on curriculum check sheets. Requirements include First-Year Composition, University General Studies (see "General Studies," page 78), and the Engineering Technology Core. Note that all three General Studies awareness areas are required. Consult your advisor for an approved list of courses. To graduate, students are required to complete a minimum of 128 semester hours with a 2.00 cumulative GPA, including at least 50 semester hours of upper-division courses.

Manufacturing Engineering Technology—B.S.

The B.S. degree in Manufacturing Engineering Technology requires 128 semester hours as specified below:

Engineering technology core	14
First-Year Composition.....	6
General Studies/department requirements	45
Manufacturing Engineering Technology major	52
Selected concentration	11
Total	128

The following courses constitute the Manufacturing Engineering Technology major and are required of all manufacturing engineering technology students. Refer to the specific concentrations for additional requirements.

Manufacturing Engineering Technology Major

EET 406 Control System Technology	4
MET 231 Manufacturing Processes	3
MET 300 Applied Material Science.....	4
MET 302 Welding Survey	3
MET 313 Applied Engineering Mechanics: Materials.....	4
MET 331 Design for Manufacturing I	3
MET 341 Manufacturing Analysis	3
MET 344 Casting and Forming Processes	3
MET 345 Advanced Manufacturing Processes	3
MET 396 Manufacturing Professional Orientation.....	1
MET 401 Quality Assurance	3
MET 416 Applied Computer-Integrated Manufacturing CS.....	3
MET 443 N/C Computer Programming.....	3
MET 444 Production Tooling.....	3
MET 451 Introduction to Automation.....	3
MET 460 Manufacturing Capstone Project I.....	3
MET 461 Manufacturing Capstone Project II.....	3
Total	52

A student participating in the Manufacturing Engineering Technology program may select from two concentrations: manufacturing engineering technology or mechanical engineering technology.

Manufacturing Engineering Technology Concentration.

This concentration is designed to prepare technologists with both conceptual and practical applications of processes, materials, and products related to manufacturing industries. Accordingly, this concentration is intended to prepare students to meet the responsibilities in planning the processes of production, developing the tools and machines, and integrating facilities for production or manufacturing.

Students may select course work that focuses on the implementation of design and manufacturing strategies that favorably impact the environment. Concepts like design for recyclability, manufacturing material reuse, and air quality control during manufacturing are addressed. Required courses follow:

MET 438 Design for Manufacturing II	4
MET 442 Specialized Production Processes	3
Technical electives	4
Total	11

Mechanical Engineering Technology Concentration. The primary objective of the mechanical engineering technology concentration is to prepare students for entry-level work in mechanical design and testing, either in engineering or manufacturing departments in product-oriented industries.

Major emphasis is placed on reducing the amount of time required by industry to make the graduate productive in any area of work. Students obtain a well-rounded academic background with an emphasis in mechanics and thermal sciences. Required courses follow:

AET 415 Gas Dynamics and Propulsion	3
MET 434 Applied Fluid Mechanics.....	3
MET 438 Design for Manufacturing II	4
Approved technical elective.....	1
Total	11

Aeronautical Engineering Technology—B.S.

The B.S. degree in Aeronautical Engineering Technology requires 128 semester hours as specified below:

Aeronautical Engineering Technology major	63
Engineering technology core	14
First-Year Composition.....	6
General Studies/department requirements	45
Total	128

The following courses constitute the Aeronautical Engineering Technology major and are required of all Aeronautical Engineering Technology students.

Aeronautical Engineering Technology Major

AET 150 Introduction to Aeronautical Engineering Technology	1
AET 210 Measurements and Testing	3
AET 215 Mechanics of Aerospace Systems.....	3
AET 300 Aircraft Design I	3
AET 312 Applied Engineering Mechanics: Dynamics	3
AET 396 Aerospace Professional Orientation.....	1
AET 415 Gas Dynamics and Propulsion	3
AET 417 Aerospace Structures	3
AET 420 Applied Aerodynamics and Wind Tunnel Testing	4
AET 432 Applied Heat Transfer.....	3
AET 487 Aircraft Design II.....	3
EET 406 Control System Technology.....	4
MET 231 Manufacturing Processes	3
MET 300 Applied Material Science.....	4

MET 313 Applied Engineering Mechanics: Materials.....	4
MET 331 Design for Manufacturing I	3
MET 432 Thermodynamics II.....	3
MET 434 Applied Fluid Mechanics.....	3
Programming Language course	3
Technical elective.....	6
Total	63

APPLIED SCIENCE—B.A.S.

The Bachelor of Applied Science degree is a “capstone” degree for the Associate of Applied Science degree. The B.A.S. degree exposes students to advanced concepts and diverse critical thinking skills that prepare them for future career opportunities and professional advancement.

Admission

Admission to the B.A.S. degree program is restricted to students holding an A.A.S. degree from a regionally accredited U.S. postsecondary educational institution. A GPA of 2.00 or higher is required for all resident applicants and a 2.50 for nonresident applicants.

Degree Requirements

The B.A.S. degree in the College of Technology and Applied Sciences consists of 60 semester hours of upper-division (300 level and above) courses, with 30 hours in residence. A total of 120 semester hours is required for graduation.

A.A.S. degree transfer.....	60
Assignable credit.....	6
B.A.S. core.....	15
General Studies	19
Technical concentration	20
Total	120

General Studies Curriculum

The B.A.S. curriculum builds on the general education content of the A.A.S. degree. Additional General Studies (L, CS and awareness areas) are met with courses in the core or concentration. General Studies courses focus on contextual learning.

L.....	3
MA.....	3
HU.....	3
HU or SB	3
SB.....	3
SG.....	4
Total	19

Assignable Credit

Assignable credit allows space in the curriculum for prerequisite courses needed to succeed in the program. The courses are determined by the student and the advisor.

B.A.S. Core

The area core focuses on management and organization, professional communication, quantitative analysis, and computer competency.

IMC 470 Project Management	3
ITM 344 Industrial Organization	3

MET 401 Quality Assurance	3
MET 416 Applied Computer-Integrated Manufacturing CS.....	3
TWC 400 Technical Communications L	3
Total	15

Technical Concentration

Production Technology. This concentration prepares supervisors and other personnel for technical and management positions in the manufacturing industry. The students increase their knowledge of manufacturing and gain insight into other areas, such as management, that support their professional growth.

AERONAUTICAL ENGINEERING TECHNOLOGY (AET)

AET Note 1. Flight instruction costs are not included in university tuition and fees.

AET 150 Introduction to Aeronautical Engineering Technology. (1)

fall
Introduction to the fields of aeronautical engineering and engineering technology.

AET 191 First-Year Seminar. (1–3)

not regularly offered

AET 194 Special Topics. (1–4)

not regularly offered

AET 210 Measurements and Testing. (3)

fall
Measurement systems, components, system response, and the characteristics of experimental data. Lecture, lab. Prerequisites: MET 230; PHY 112, 114.

AET 215 Mechanics of Aerospace Systems. (3)

spring
Basic physics of flight. Principles and design of aircraft systems and powerplants.

AET 294 Special Topics. (1–4)

not regularly offered

AET 300 Aircraft Design I. (3)

fall
Basic applied aerodynamics, propeller performance, and airplane performance analysis. Fee. Prerequisites: AET 210 and 215 (or AMT 280 and 287); ETC 100; MAT 260; PHY 112, 114.

AET 310 Instrumentation. (3)

fall
Measurement systems, components, system response, and the characteristics of experimental data. Methods of collecting and analyzing data. Lecture, lab. Prerequisites: ETC 201; MAT 261. Pre- or corequisite: MET 313.

AET 312 Applied Engineering Mechanics: Dynamics. (3)

fall
Masses; motion kinematics; dynamics of machinery. Prerequisites: ETC 211; MAT 261.

AET 394 Special Topics. (1–4)

not regularly offered

AET 396 Aerospace Professional Orientation. (1)

fall
Career focus for Aeronautical Engineering Technology students. Familiarization with the aerospace industry. Prerequisite: junior standing.

AET 409 Nondestructive Testing and Quality Assurance. (1)

not regularly offered
Purpose of inspection and quality assurance. Theory and application of nondestructive inspection methods. Application of pertinent standards, specifications, and codes. Lecture, lab. Cross-listed as AMT 409. Credit is allowed for only AET 409 or AMT 409. See AET Note 1. Prerequisite: AMT 280 or MET 230.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

AET 415 Gas Dynamics and Propulsion. (3)*spring*

Introduction to compressible flow, internal and external flow, and aerodynamic analysis of propulsion systems. Prerequisite: MET 434.

AET 417 Aerospace Structures. (3)*fall*

Analysis and design of aircraft and aerospace structures. Shear flow. Semimonocoque structures. Effects of dynamic loading. Prerequisites: AET 300, 312; MET 313.

AET 420 Applied Aerodynamics and Wind Tunnel Testing. (3)*fall*

Introduction to viscous and inviscid flow and their relationship to aircraft lift and drag. Wind tunnel design and testing. Lecture, lab. Prerequisites: AET 300; MET 434.

AET 432 Applied Heat Transfer. (3)*fall*

Steady-state and transient conduction, heat transfer by convection and radiation. Applications of heat transfer. Prerequisite: MET 434 or instructor approval.

AET 484 Internship. (1–12)*not regularly offered***AET 487 Aircraft Design II. (3)***spring*

Basic aerodynamics and airplane performance analysis methods applied to practical design project. Prerequisite: AET 300.

AET 490 Advanced Applied Aerodynamics. (3)*not regularly offered*

Study of fluid motion and aerodynamics. Essentials of incompressible aerodynamics and computational fluid dynamics. Elements of laminar and turbulent flows. Prerequisites: AET 312; ETC 100; MAT 262.

AET 492 Honors Directed Study. (1–6)*not regularly offered***AET 493 Honors Thesis. (1–6)***not regularly offered***AET 494 Special Topics. (1–4)***not regularly offered***AET 498 Pro-Seminar. (1–7)***not regularly offered***AET 499 Individualized Instruction. (1–3)***not regularly offered***AET 500 Research Methods. (1–12)***not regularly offered***AET 524 Application of Heat Transfer. (3)***fall*

Energy conservation, steady-state and transient conduction, convection transfer, free and forced convection Reynolds analogy, blackbody and environmental radiation. Prerequisite: MET 434 or instructor approval.

AET 525 Advanced Propulsion. (3)*spring*

Mechanics and thermodynamics of propulsion systems. Solid, liquid propellant rocket design performance. Electrical nuclear propulsion systems. Space missions. Prerequisites: both AET 415 and 420 (or MET 434) or only instructor approval.

AET 560 Numerical Methods in Engineering Technology. (3)*not regularly offered*

Analyzing problems in physical sciences, modeling of physical problems, perturbation techniques, curvefitting, data analysis, numerical solutions, ordinary and partial differential equations.

AET 580 Practicum. (1–12)*not regularly offered***AET 583 Field Work. (1–12)***not regularly offered***AET 584 Internship. (1–12)***not regularly offered***AET 590 Reading and Conference. (1–12)***not regularly offered***AET 591 Seminar. (1–12)***not regularly offered***AET 592 Research. (1–12)***not regularly offered***AET 593 Applied Project. (1–12)***not regularly offered***AET 594 Conference and Workshop. (1–12)***not regularly offered***AET 595 Continuing Registration. (1)***not regularly offered***AET 598 Special Topics. (1–4)***not regularly offered***AET 599 Thesis. (1–12)***not regularly offered***MANUFACTURING ENGINEERING TECHNOLOGY (MET)****MET 191 First-Year Seminar. (1–3)***not regularly offered***MET 194 Special Topics. (1–4)***not regularly offered***MET 230 Engineering Materials and Processing. (3)***fall, spring, summer*

Materials, their structures, properties, fabrication characteristics, and applications. Material forming, joining, and finishing processes. Automation and quality control.

MET 231 Manufacturing Processes. (3)*fall*

Design documentation and material processes on plastics, ferrous and nonferrous materials, emphasizing orthographic projection, geometric dimensioning and tolerances. Lecture, lab. Prerequisite: MAT 117 or 170.

MET 294 Special Topics. (1–4)*not regularly offered***MET 300 Applied Material Science. (4)***fall*

Principles of materials science emphasizing concepts relevant to manufacturing and use. Discusses metals, polymers, ceramics, and composites. 3 hours lecture, 1 hour lab. Prerequisite: MET 231 or instructor approval.

MET 302 Welding Survey. (3)*fall*

Theory and application of industrial welding processes; introductory welding metallurgy and weldment design; SMAW, GTAW, GMAW, oxy-acetylene, and brazing experiences. Lecture, lab. Prerequisite: junior or senior standing.

MET 313 Applied Engineering Mechanics: Materials. (4)*fall, spring, summer*

Stress, strain, relations between stress and strain, shear, moments, deflections, and combined stresses. 3 hours lecture, 1 hour lab. Prerequisite: ETC 211.

MET 331 Design for Manufacturing I. (3)*spring*

Introduction to design of machines and structures, with emphasis on layout design drawing. Emphasizes basics of gears, cams, fasteners, springs, bearing linkages, cylindrical fits, flat pattern development, and surface finish requirements. Prerequisite: MET 313.

MET 341 Manufacturing Analysis. (3)*spring*

Organization and functional industrial requirements. Manufacturing economics and group technology. Writing assembly and production plans. Analysis on industrial specifications. Prerequisite: MET 231 or 343.

MET 343 Material Processes. (4)*spring*

Industrial processing as applied to low-, medium-, and high-volume manufacturing. Basic and secondary processing, fastening and joining, coating, and quality control. Lecture, lab.

MET 344 Casting and Forming Processes. (3)*spring*

Analyzes various forming processes to determine load requirements necessary for a particular metal-forming operation. Information used to select equipment and design tooling. Metal casting processes and design of castings. Introduction to powder metallurgy. Prerequisites: both MET 300 and 313 or only instructor approval.

MET 345 Advanced Manufacturing Processes. (3)*spring*

Material removal processes emphasizing advanced turning, milling, and machinability studies using cutting tools. CNC programming for machining and turning centers. Lecture, lab. Prerequisite: MET 231.

MET 346 Numerical Control: Point-to-Point and Continuous Path Programming. (3)*not regularly offered*

Methods of programming, set up, and operation of numerical control machines, emphasizing lathe and mill systems. Lecture, lab. Prerequisite: MET 231.

MET 394 Special Topics. (1–4)*not regularly offered***MET 396 Manufacturing Professional Orientation. (1)***fall*

Career focus for Manufacturing Engineering Technology students. Familiarization with the manufacturing industry. Prerequisite: junior standing.

MET 401 Quality Assurance. (3)*spring*

Introduction to statistical quality control methods design of experiments, sampling, gage requirements, specifications, quality assurance tools emphasizing CNC-CMM programming. Lecture, lab. Prerequisite: junior standing.

MET 409 Applied Engineering Economics. (3)*spring*

Fundamentals of engineering economics in a practical, industry-based approach. Includes effects of depreciation, taxes, inflation, and replacement analysis. Lecture, computer lab experiences.

MET 415 Manufacturing Simulation. (3)*spring*

Computer simulation of manufacturing operations. Discrete event simulation models range from individual processes to whole factories. Lecture, computer lab experiences. Prerequisite: MET 345.

MET 416 Applied Computer-Integrated Manufacturing. (3)*fall*

Techniques and practices of computer-integrated manufacturing, with emphasis on computer-aided design and computer-aided manufacturing. Prerequisite: MET 345.

*General Studies: CS***MET 432 Thermodynamics. (3)***spring*

Thermodynamics of mixtures. Combustion process. Applies thermodynamics to power and refrigeration cycles. Prerequisite: ETC 340.

MET 433 Thermal Power Systems. (4)*not regularly offered*

Analyzes gas power, vapor power, and refrigeration cycles. Components of air conditioning systems. Direct energy conversion. Psychrometry. Analyzes internal combustion engines and fluid machines. Lecture, lab. Prerequisite: MET 432 or instructor approval.

MET 434 Applied Fluid Mechanics. (3)*spring*

Fluid statics. Basic fluid flow equations. Viscous flow in pipes and channels. Compressible flow. Applies fluid measurement and flow in conduits. Prerequisite: ETC 340.

MET 435 Alternate Energy Sources. (3)*not regularly offered*

Alternate energy systems, energy use and its impact on the environment, and demonstrating practical alternative energy sources to fossil fuels. Prerequisite: instructor approval.

MET 436 Turbomachinery Design. (3)*not regularly offered*

Applies thermodynamics and fluid mechanics to the analysis of machinery design and power cycle performance predictions. Prerequisites: ETC 340; MET 434.

MET 438 Design for Manufacturing II. (4)*fall*

Applies mechanics in design of machine elements and structures. Uses experimental stress analysis in design evaluation. Lecture, lab. Prerequisite: AET 312 or MET 331 or instructor approval.

MET 442 Specialized Production Processes. (3)*fall*

Nontraditional manufacturing processes, emphasizing EDM, ECM, ECG, CM, PM, HERF, EBW, and LBW. Prerequisite: MET 231.

MET 443 CNC Computer Programming. (3)*fall*

Theory and application of N/C languages using CAM software and CNC machine tools. Lecture, lab. Prerequisite: MET 345 or instructor approval.

MET 444 Production Tooling. (3)*fall*

Design and fabrication of jigs, fixtures, and special industrial tooling related to manufacturing methods. Lecture, lab. Prerequisite: MET 345.

MET 448 Expert Systems in Manufacturing. (3)*not regularly offered*

Introduction to expert systems through conceptual analysis, with emphasis on manufacturing applications. Prerequisite: MET 231.

MET 451 Introduction to Automation. (3)*spring*

Introduction to automation. Topics include assembly techniques, fixed and flexible automation systems, robots, material-handling systems, sensors, and controls. Lecture, lab. Prerequisite: MET 346.

MET 452 Implementation of Robots in Manufacturing. (3)*not regularly offered*

Robotic workcell design, including end effectors, parts presenters, and optimum material flow. Prerequisite: MET 451 or instructor approval.

MET 453 Robotic Applications. (3)*spring*

Lab course utilizing robots and other automated manufacturing equipment to produce a part. Students are required to program robots, as well as interface the robots with other equipment. Prerequisite: instructor approval.

MET 460 Manufacturing Capstone Project I. (3)*fall*

Small-group projects designing, evaluating, and analyzing components, assemblies, and systems. Develop products/manufacturing techniques demonstrating state-of-the-art technology. Lecture, lab. Prerequisites: MET 331, 341, 346; senior standing.

MET 461 Manufacturing Capstone Project II. (3)*spring*

Small-group projects applying manufacturing techniques, with emphasis on demonstrating state-of-the-art technology. Lecture, lab. Prerequisite: MET 460 or instructor approval.

MET 484 Internship. (1–12)*not regularly offered***MET 492 Honors Directed Study. (1–6)***not regularly offered***MET 493 Honors Thesis. (1–6)***not regularly offered***MET 494 Special Topics. (1–4)***fall and spring*

Possible topics:

- (a) Consumer Manufacturing. (1–3)
- (b) Manufacturing Process Simulation. (1–3)
- (c) Packaging Design. (1–3)

MET 498 Pro-Seminar. (1–7)*not regularly offered***MET 499 Individualized Instruction. (1–3)***not regularly offered***MET 500 Research Methods. (1–12)***not regularly offered***MET 501 Statistical Quality Control Applications. (3)***spring*

SPC problem-solving techniques for implementation in industrial setting; design and analysis of experiments. Prerequisite: instructor approval.

MET 502 Specialized Production Processes. (3)*fall*

Specialized production processes including lasers, electronic beam, abrasive and water jet, and chemical and thermal processes. Prerequisite: instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.

MET 504 Applications of Production Tooling. (3)*fall*

Design and fabrication of fixtures, jigs, templates, and specialized industrial tooling for manufacturing. Lecture, lab. Prerequisite: instructor approval.

MET 507 Manufacturing Enterprise. (3)*fall and spring*

Organization and project management of cellular manufacturing methods, including IIT and lean manufacturing. Prerequisite: instructor approval.

MET 509 Applied Engineering Economics. (3)*spring*

Fundamentals of engineering economics in a practical, industry-based approach. Includes effects of depreciation, taxes, inflation, and replacement analysis. Lecture, computer lab experiences.

MET 512 Introduction to Robotics. (3)*not regularly offered*

Introduction to industrial robots. Topics include: robot workspace, trajectory generation, robot actuators and sensors, design of end effectors, and economic justification. Application case studies. Prerequisite: instructor approval.

MET 513 Advanced Automation. (3)*fall*

Analysis and design of hard and flexible automation systems. Particular attention to material-handling technology. Prerequisite: instructor approval.

MET 514 CNC Computer Programming. (3)*spring*

Theory and application of N/C languages using CAM software and CNC machine tools. Lecture, lab. Prerequisite: instructor approval.

MET 515 Manufacturing Simulation. (3)*spring*

Computer simulation of manufacturing operations. Discrete event simulation models range from individual processes to whole factories. Lecture, computer lab experiences.

MET 517 Applied Computer-Integrated Manufacturing. (3)*fall*

Techniques and practices of computer-integrated manufacturing, with emphasis on computer-aided design and computer-aided manufacturing. Prerequisite: MET 345 or instructor approval.

MET 560 Fundamentals of Security Engineering. (3)*fall*

Definitions of threats, fundamentals of design of physical protection systems, computer modeling and analysis of security systems.

MET 571 Waste Minimization and Waste Prevention. (3)*spring*

Life cycle analysis, selection of environmentally compatible materials, design of waste minimization equipment and operation, economics of waste minimization and prevention. Prerequisite: ETC 340 or instructor approval.

MET 580 Practicum. (1–12)*not regularly offered***MET 584 Internship. (1–12)***not regularly offered***MET 590 Reading and Conference. (1–12)***not regularly offered***MET 591 Seminar. (1–12)***not regularly offered***MET 592 Research. (1–12)***not regularly offered***MET 593 Applied Project. (1–12)***not regularly offered***MET 594 Conference and Workshop. (1–12)***not regularly offered***MET 595 Continuing Registration. (1)***not regularly offered***MET 598 Special Topics. (1–4)***not regularly offered***MET 599 Thesis. (1–12)***not regularly offered***SECURITY ENGINEERING TECHNOLOGY (SET)**

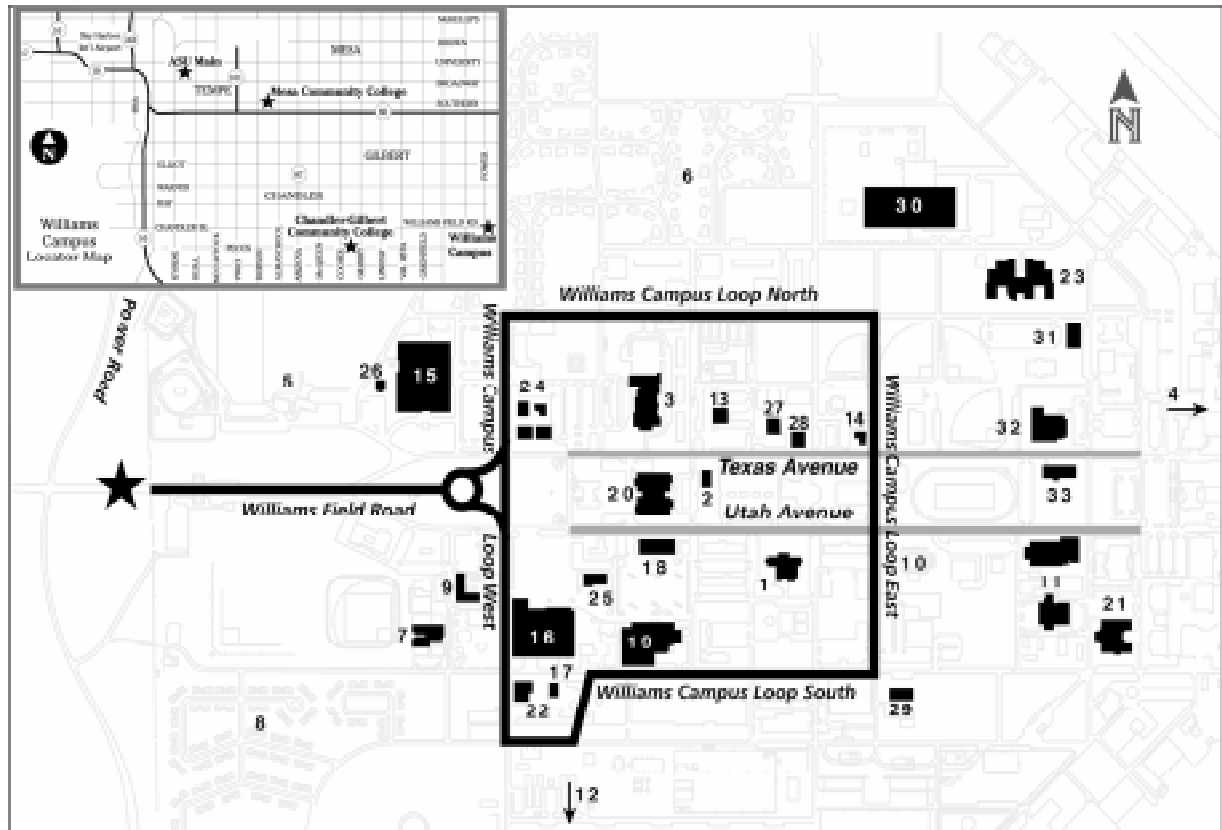
See the *Graduate Catalog* for the SET courses.



Preflight instruction

Dave Tevis photo

ASU East Map



WILLIAMS CAMPUS

- 1 Williams Campus Dining Hall (El Mirage)
- 2 Williams Campus Housing Office
- 3 Williams Campus Union (CU)
- 4 Williams Gateway Airport and Flight Line
- 5 Toka Sticks Clubhouse and Golf Course
- 6 North Desert Village
- 7 Child Development Center (CDCTR)
- 8 West Desert Village
- 9 Administrative Services Building—Security (ADMIN)
- 10 Swimming Pool (POOL)
- 11 Research Training Laboratory
- 12 South Desert Village
- 13 Williams Express Copy Services (COPY)
- 14 Williams Campus Post Office (WCPO)

CHANDLER-GILBERT COMMUNITY COLLEGE AT WILLIAMS CAMPUS

- 30 Aviation Technology Center, Embry-Riddle, and University of North Dakota (ATC)
- 31 General Studies Building (GSB)
- 32 Physical Education Center (PEC)
- 33 Science Lab Building (SLB)

ASU EAST

- 15 Health Sciences Center (ASU East Student Health, VA Clinic)
- 16 Technology Center (TECH)
- 17 Agribusiness Food Science Lab (AGBFS)
- 18 Auditorium (AUD)
- 19 Future Classroom and Lab Building
- 20 Academic Center Building (CNTR)
- 21 Classroom Building (CLRB)
- 22 TECH II
- 23 Flight Simulator Building (SIM)
- 24 Morrison School of Agribusiness and Resource Management Complex (AGB 1–4)
- 25 Communication (COMM2)
- 26 Professional Golf Management (PGM)
- 27 American Indian Programs (AIP)
- 29 International Projects Unit (INTRP)
- 29 Photovoltaic Testing Lab (SOLAR)

ASU East Directory

For the "ASU Main Directory," see page 522. For the "ASU West Directory," see page 674. For the "ASU Extended Campus Directory," see page 691.

Organization	Location	Telephone	Web Address
Agribusiness and Resource Management, Morrison School of	CNTR 20	480/727-1585	www.east.asu.edu/msabr
American Indian Programs	AIP	480/727-1161 480/727-1075	www.east.asu.edu/aip
Bookstore	CNTR 102	480/727-1146	www.asu.edu/east/admin/business.htm#Bookstore
Campus Union	CUB	480/727-1098	www.asu.edu/east/cls/union.htm
Cashiering Services	CNTR 81	480/727-1081	www.asu.edu/east/admin/ business.htm#CashieringServices
Computer Commons, ASU East	—	480/727-1184	www.east.asu.edu/infotech/labs
East College	CNTR 92	480/727-1515	www.east.asu.edu/ecollege
Applied Psychology, Faculty of	—	—	www.east.asu.edu/ecollege/appliedpsych
Business Administration, Faculty of	—	—	www.east.asu.edu/ecollege/businessadmin
Elementary Education, Faculty of	—	—	www.east.asu.edu/ecollege/elementaryed
Exercise and Wellness, Faculty of	—	—	www.east.asu.edu/ecollege
Multimedia Writing and Technical Communication, Faculty of	—	—	www.east.asu.edu/ecollege/multimedia
Nutrition, Department of	—	—	www.east.asu.edu/ecollege/nutrition
Fitness Center, Williams Campus	WCFC Bldg	480/988-8400	www.asu.edu/east/cls/recreation.html
General Information	CNTR Garden Level	480/727-3278	www.east.asu.edu
Housing, Williams Campus	WCHO Bldg	480/727-1700	www.asu.edu/east/cls/housing
Learning Center	CNTR 160	480/727-1452	www.east.asu.edu/learningcenter
Library Services	CNTR 110	480/727-1037	eastlib.east.asu.edu
Nutrition, Department of	HSC 1386	480/727-1728	www.east.asu.edu/ecollege/nutrition
OASIS	CNTR Garden Level	480/727-3278	www.east.asu.edu/stu/oasis.html
ASU Sun Cards	—	—	—
Office of the Registrar	—	—	—
Student Business Services	—	—	—
Student Financial Assistance	—	—	—
Undergraduate Admissions	—	—	—
Williams Campus Parking Decals	—	—	—
Printing and Copy Center, Williams Express	BLDG 210	480/727-1600 480/727-1616	www.valleyofthesun.org/printshop.htm
Provost, Office of the	CNTR 30	480/727-1028	—
Student Health Services	Veterans	602/222-6568	www.asu.edu/east/student/stuhealth.html
Technology and Applied Sciences, College of	CNTR 10	480/727-1874	www.east.asu.edu/ctas
Aeronautical Management Technology, Department of	SIM 201	480/727-1381	www.east.asu.edu/ctas/amt
Electronics and Computer Engineering Technology, Department of	TECH 101	480/727-1137	www.east.asu.edu/ctas/ecet
Information and Management Technology, Department of	TECH 102	480/727-1781	www.east.asu.edu/ctas/imt
Manufacturing and Aeronautical Engineering Technology, Department of	SIM 295	480/727-1584	www.east.asu.edu/ctas/maet

ASU East Faculty and Academic Professionals

A

Abuleyaman, Eltayeb S. (1998), Associate Professor of Electronics and Computer Engineering Technology; B.S., University of Khartoum (Sudan); M.S., Oregon State University; Ph.D., University of Arizona

Autore, Donald D. (1959), Professor Emeritus of Technology; B.S.E., University of Michigan; M.S.E., Arizona State University

B

Backus, Charles E. (1968), Professor of Electrical Engineering; Campus Chief Executive Officer and Provost, ASU East; Vice President, ASU; B.S.M.E., Ohio University; M.S., Ph.D., University of Arizona

Barchilon, Marian G. (1989), Professor of Technical Communication; B.A., State University of New York, Binghamton; M.S., Northeastern University

Barrett, Thomas W. (1950), Professor Emeritus of Agribusiness and Resource Management; B.S., Brigham Young University; M.S., Ph.D., Cornell University

Bergeron, Bette S. (2000), Professor of Education; B.S.Ed., University of Maine, Orono; M.S.Ed., Ph.D., Purdue University

Brady, Ward W. (1973), Professor of Environmental Resources; B.S., M.S., Ph.D., Colorado State University

Brock, John H. (1977), Professor of Environmental Resources; B.S., M.S., Fort Hayes State University; Ph.D., Texas A&M University

Brown, Walter C. (1966), Professor Emeritus of Technology; B.S., Northwest Missouri State University; M.Ed., Ed.D., University of Missouri, Columbia

Brownson, Charles W. (1980), Librarian, ASU East Library Services; Director, ASU East Library Services; B.A., South Dakota State University; M.F.A., University of Oregon; M.L.S., University of California, Berkeley

Burdette, Walter E. (1956), Professor Emeritus of Technology; B.S., M.S., Kansas State College of Pittsburg; Ed.D., University of Missouri, Columbia

Burk, Karl W. (1949), Professor Emeritus of Technology; B.A., M.A., Arizona State University; Ed.D., Bradley University

Burkink, Tim (1998), Assistant Professor of Agribusiness and Resource Management; B.S., M.B.A., Ph.D., University of Nebraska, Lincoln

C

Carlsen, Paul A. (1978), Professor Emeritus of Technology; B.A.E., M.N.S., Ed.D., Arizona State University

Cavalliere, William A. (1946), Professor Emeritus of Technology; B.A., M.A., Arizona State University

Chalquest, Richard R. (1971), Professor Emeritus of Agribusiness and Resource Management; B.S., D.V.M., Washington State University; M.S., Ph.D., Cornell University

Collins, Donald W. (1989), Professor of Manufacturing and Aeronautical Engineering Technology; B.Arch., Virginia Polytechnic Institute and State University; M.S., Ph.D., University of Illinois, Chicago

Corbin, Charles B. (1982), Professor of Exercise and Wellness; B.S., University of New Mexico; M.S., University of Illinois; Ph.D., University of New Mexico

Cox, Frank E. (1972), Professor Emeritus of Technology; B.S.M.E., Purdue University; M.S.E., Arizona State University

Cox, Jerry R. (1984), Adjunct Associate Professor of Environmental Resources; B.S., M.S., New Mexico State University; Ph.D., University of Wyoming

D

Daneke, Gregory A. (1982), Professor of Agribusiness and Resource Management; B.A., M.A., Brigham Young University; Ph.D., University of California, Santa Barbara

Danielson, Scott G. (1999), Associate Professor of Manufacturing and Aeronautical Engineering Technology; Chair, Department of Manufacturing and Aeronautical Engineering Technology; B.S., M.S., University of Wyoming; Ph.D., North Dakota State University

DeBano, Leonard F. (1983), Adjunct Associate Professor of Environmental Resources; B.S., Colorado State University; M.S., Utah State University; Ph.D., University of California, Berkeley

Dixon, Kathleen S. (2000), Lecturer of Nutrition; B.S., University of Arizona; M.Ed., Northern Arizona University

Dolin, Penny Ann (1998), Lecturer of Information and Management Technology; B.A., Bard College; M.S., Arizona State University

Duff, Jon M. (1997), Professor of Information and Management Technology; B.S., M.S., Purdue University; Ph.D., Ohio State University

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Edwards, Mark R. (1978), Professor of Agribusiness and Resource Management; B.S.M.E., United States Naval Academy; M.B.A., D.B.A., Arizona State University

Edwards, Marvin J. (1959), Professor Emeritus of Technology; B.S., M.A., Arizona State University

F

Fordemwalt, James N. (1987), Professor Emeritus of Electronics and Computer Engineering Technology; B.S., M.S., University of Arizona; Ph.D., Iowa State University of Science and Technology

G

Gesell, Laurence E. (1984), Professor of Aeronautical Management Technology; B.A., Upper Iowa University; M.P.A., University of San Francisco; Ph.D., Arizona State University

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Green, Douglas M. (1990), Associate Professor of Environmental Resources; B.S., Oregon State University; M.S., North Dakota State University; Ph.D., Oregon State University

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H

Hampf, Jeffrey (1998), Assistant Professor of Nutrition; B.S., Liberty University; M.S., University of Massachusetts, Lowell; Ph.D., University of Nebraska

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Hefner, Stephen P. (1973), Instructional Professional of Agribusiness and Resource Management, Morrison School of Agribusiness and Resource Management; B.S., Illinois State University; M.S., Arizona State University

Hild, Nicholas R. (1983), Professor of Information and Management Technology; B.S.M.E., M.S.Enve., University of Iowa; Ph.D., Union Graduate School

Hirata, Ernest T. (1974), Associate Professor of Information and Management Technology; B.A., San Diego State College; Ed.D., Arizona State University

Horowitz, Renee B. (1986), Professor Emeritus of Information and Management Technology; B.A., Brooklyn College; M.A., Ph.D., University of Colorado

Humble, Jane E. (1989), Associate Professor of Information and Management Technology; B.S.E., M.S.E., Ph.D., Arizona State University

Hutt, Roger W. (1975), Associate Professor of Business Administration; B.S., M.B.A., Ohio State University; Ph.D., Michigan State University

J

Jackson, Andrew E. (1995), Associate Professor of Aeronautical Management Technology; B.A., University of Louisville; M.B.A., Embry-Riddle Aeronautical University; Ph.D., University of Central Florida

Johnson, Randall A. (1984), Adjunct Associate Professor of Environmental Resources; B.S., California State Polytechnic University, Pomona; M.A., M.S., Ph.D., University of Missouri, Columbia

Johnston, Carol S. (1986), Professor of Nutrition; B.S., University of Michigan; M.S., Ph.D., University of Texas, Austin

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K

Kagan, Albert (1992), Professor of Agribusiness and Resource Management; B.S., M.S., Ph.D., Iowa State University of Science and Technology

Karp, Merrill R. (1994), Assistant Professor of Aeronautical Management Technology; B.S., Arizona State University; M.A., Central Michigan University; Ph.D., Walden University

Keith, Marlow F. (1946), Professor Emeritus of Technology; B.A., M.A., Arizona State University

Kelley, Donald G. (1980), Professor Emeritus of Manufacturing and Aeronautical Engineering Technology; B.S., M.S., Arizona State University

Kigin, Denis J. (1958–65; 1967), Professor Emeritus of Technology; Dean Emeritus, Continuing Education and Summer Sessions; B.S., Mankato State University; M.S., University of Wisconsin, Stout; Ed.D., University of Missouri

Kime, Charles H. (1999), Assistant Professor of Information and Management Technology; B.S., Arizona State University; M.B.A., University of Phoenix; D.P.A., Arizona State University

Kisielewski, Robert V. (1978), Professor Emeritus of Technology; B.S.M.E., M.S.M.E., University of Wisconsin, Madison

Kleemann, Gary L. (1979), Administrative Professional, Academic Programs; Director, E-Learning; B.A., M.S., San Jose State University; Ph.D., Arizona State University

L

Lawler, Eugene D. (1967), Professor Emeritus of Technology; B.S., Northern State College; M.A., Arizona State University

Lestar, Dot J. (1995), Lecturer of Information and Management Technology; B.S., M.Tech., Arizona State University

Lindquist, Timothy (1985), Professor of Electronics and Computer Engineering Technology; Chair, Department of Electronics and Computer Engineering Technology; B.S., Purdue University; M.S., Ph.D., Iowa State University

Lipari, Charles A. (1995), Assistant Professor of Electronics and Computer Engineering Technology; B.S.E.E., M.S.E.E., University of Southwestern Louisiana; Ph.D., Louisiana State University

Lytle, Robert G. (1972), Professor Emeritus of Agribusiness and Resource Management; B.S., Western Kentucky University; M.S., Arizona State University

M

Macia, Narciso F. (1990), Associate Professor of Electronics and Computer Engineering Technology; B.S., M.S., University of Texas, Arlington; Ph.D., Arizona State University

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Maid, Barry M. (2000), Professor of Multimedia Writing and Technical Communication; B.A., University of Wisconsin, Madison; M.A., University of Texas, Austin; Ph.D., University of Massachusetts, Amherst

Maisel, James E. (1985), Professor Emeritus of Electronics and Computer Engineering Technology; B.Eng.Sci., B.E.E., Fenn College; M.S.E.E., Ohio State University

Manfredo, Mark R. (1999), Assistant Professor of Agribusiness and Resource Management; B.S., California State University, Fresno; M.S., New Mexico State University; Ph.D., University of Illinois, Urbana

Manore, Melinda M. (1984), Professor of Nutrition; B.S., Seattle Pacific University; M.S., University of Oregon; Ph.D., Oregon State University

Marquardt, Raymond A. (1997), Professor of Agribusiness and Resource Management; Dean, Morrison School of Agribusiness and Resource Management; B.S., M.S., Colorado State University; Ph.D., Michigan State University

Martin, Rose L. (1990), Senior Lecturer of Nutrition; B.S., University of Illinois; M.S., Pennsylvania State University

Matson, John H. (1978), Associate Professor of Information and Management Technology; B.S., M.S., Illinois State University

Matthews, James B. (1989), Professor Emeritus of Aeronautical Technology; B.S., Rose-Hulman Institute of Technology; M.S., Massachusetts Institute of Technology; Ph.D., University of Arizona

McBrien, Edward F. (1986), Professor Emeritus of Electronic/Computer Technology; B.S.E., Fenn College; M.S.E.E., Cleveland State University

McCurry, William K. (1995), Associate Professor of Aeronautical Management Technology; Chair, Department of Aeronautical Management Technology; B.S., Purdue University; M.S., Troy State University; Ph.D., University of Kansas

McHenry, Albert L. (1978), Professor of Electronics and Computer Engineering Technology; Dean, College of Technology and Applied Sciences; B.S., Southern University and A&M College; M.S., Ph.D., Arizona State University

Mermis, William L. (1995), Professor of Human Health; B.S., M.S., Saint Louis University; Ph.D., Arizona State University

Millard, Bruce R. (1988), Associate Professor of Electronics and Computer Engineering Technology; B.A., M.S., Washington State University; Ph.D., Arizona State University

Miller, Victor J. (1958), Professor Emeritus of Agribusiness and Resource Management; B.S., M.S., Ph.D., University of Illinois

Miller, William H. (1984), Associate Professor of Environmental Resources; B.S., M.S., Ph.D., Washington State University

Minter, Marshall R. Jr. (1965), Professor Emeritus of Technology; B.S.M.E., Purdue University; M.S.M.E., University of Arizona

Monte, Woodrow (1979), Associate Professor of Nutrition; B.S., New Mexico Institute of Mining and Technology; M.S., Ph.D., Colorado State University

Moody, E. Grant (1951), Professor Emeritus of Agribusiness and Resource Management; B.S., University of Arizona; M.S., Kansas State University; Ph.D., Purdue University

Munukutla, Lakshmi V. (1987), Professor of Electronics and Computer Engineering Technology; Associate Dean, College of Technology and Applied Sciences; B.S., M.S., Andhra University (India); Ph.D., Ohio University

N

Nam, Changho (1998), Associate Professor of Manufacturing and Aeronautical Engineering Technology; B.S., M.S., Seoul National University (South Korea); Ph.D., Purdue University

O

O'Brien, Marc H. (1997), Lecturer of Aeronautical Management Technology; B.A., Boston University; M.S., Indiana State University

Olson, Larry W. (1995), Associate Professor of Information and Management Technology; B.S., Baylor University; Ph.D., University of Pennsylvania

P

Palmgren, Dale E. (1984), Associate Professor of Manufacturing and Aeronautical Engineering Technology; Assistant Dean, College of Technology and Applied Sciences; B.S., M.S., Ph.D., University of Wisconsin, Madison

Pardini, Louis J. (1967), Professor Emeritus of Technology; B.A., A.M., Idaho State University; Ed.D., University of Northern Colorado

Patterson, Paul M. (1995), Assistant Professor of Agribusiness and Resource Management; B.S., Auburn University; M.S., Ph.D., Purdue University

Pearce, Martha V. (1977), Professor Emeritus of Technology; B.S., Columbia University; M.S., Boston University; Ed.D., Arizona State University

Pearson, Michael W. (1998), Assistant Professor of Aeronautical Management Technology; B.A., University of Houston; M.B.A., J.D., Arizona State University

Peterson, Danny M. (1999), Associate Professor of Information and Management Technology; B.S., University of Idaho; M.B.A., California State University, Sacramento; M.S., Ph.D., Arizona State University

Peterson, Edward R. (1977), Assistant Professor of Electronics and Computer Engineering Technology; B.S.E.E., Fairleigh Dickinson University; M.S.E.E., Arizona State University

Phillips, Wayne T. (1997), Assistant Professor of Exercise and Wellness; Cert. Ed., Cardiff College of Education, Cardiff (United Kingdom); M.S., Loughborough University of Technology (United Kingdom); Ph.D., Arizona State University

Post, Alvin (2000), Assistant Professor of Manufacturing and Aeronautical Engineering Technology; B.S., University of Arizona; M.S., Stanford University; Ph.D., University of Hawaii

Prust, Zenas A. (1959), Professor Emeritus of Technology; B.S., University of Wisconsin, Stout; M.A., University of Minnesota, Twin Cities; Ed.D., University of Northern Colorado

R

Raccach, Moshe (1980), Associate Professor of Agribusiness and Resource Management; B.Sc., M.Sc., The Hebrew University (Israel); Ph.D., Cornell University

Rajadas, John N. (1996), Associate Professor of Manufacturing and Aeronautical Engineering Technology; B.Tech., Indian Institute of Technology (India); M.S., Ph.D., Georgia Institute of Technology

Rasmussen, Robert D. (1949), Professor Emeritus of Agribusiness and Resource Management; B.S., Iowa State University; M.S., Washington State University

Reed, William H. (1968), Professor Emeritus of Manufacturing and Aeronautical Engineering Technology; B.S., University of Oklahoma; M.S., Arizona State University

Richards, Timothy J. (1994), Associate Professor of Agribusiness and Resource Management; B.Comm., University of British Columbia; M.A., Ph.D., Stanford University

Richardson, Grant L. (1953), Professor Emeritus of Agribusiness and Resource Management; B.S., M.S., University of Arizona; Ph.D., Oregon State University

Robinson, Daniel O. (1950), Professor Emeritus of Agribusiness and Resource Management; A.B., Brigham Young University; M.S., University of Arizona; Ph.D., Ohio State University

Roe, Keith B. (1979), Professor Emeritus of Technology; B.S., Wisconsin State College; M.A., University of Michigan

Rogers, Bradley B. (1984), Associate Professor of Manufacturing and Aeronautical Engineering Technology; B.S., M.S., Montana State University; Ph.D., Arizona State University

Rook, Fern H. (1969), Professor Emeritus of Technology; B.A., University of Colorado; M.A., Arizona State University

Roper, Devon J. (1966), Professor Emeritus of Aeronautical Technology; B.S., Utah State University; M.S., Arizona State University

S

Sadowski, Mary A. (1999), Professor of Information and Management Technology; B.S.E., Bowling Green University; M.A., Ohio State University; Ph.D., Purdue University

Salmirs, Seymour (1981), Professor Emeritus of Technology; B.A.E., M.S.A.E., Georgia Institute of Technology

Schildgen, Thomas E. (1981), Professor of Information and Management Technology; Chair, Department of Information and Management Technology; B.S., M.S., Illinois State University; Ed.D., Northern Arizona University

Schmidt, Peter A. (1978), Associate Professor of Manufacturing and Aeronautical Engineering Technology; B.S., Northern Illinois University; M.A., Ed.D., Arizona State University

Schmitz, Troy G. (1998), Assistant Professor of Agribusiness and Resource Management; B.S., University of Saskatchewan (Canada); M.S., Ph.D., University of California, Berkeley

Schoen, Robert A. (1966), Professor Emeritus of Technology; B.S., M.S., Arizona State University

Schvaneveldt, Roger (2000), Professor of Applied Psychology; B.A., University of Utah; M.S., Ph.D., University of Wisconsin, Madison

Schwalm, David E. (1986), Associate Professor of English; Dean of East College, Vice Provost ASUE; B.A., Carlton College; M.S., Ph.D., University of Chicago

Seperich, George J. (1976), Professor of Agribusiness and Resource Management; Associate Dean, Morrison School of Agribusiness and Resource Management; B.S., Loyola University, Chicago; M.S., Ph.D., Michigan State University

Shultz, Clifford J. (1992), Professor of Agribusiness and Resource Management; Marley Foundation Chair in Consumer Food Marketing; B.A., DePauw University; M.S., Ph.D., Columbia University

Stanton, Julie V. (1996), Assistant Professor of Agribusiness and Resource Management; B.A., Georgetown University; Ph.D., University of Maryland, College Park

Stiles, Philip G. (1969), Professor Emeritus of Agribusiness and Resource Management; B.S., University of Arkansas; M.S., University of Kentucky; Ph.D., Michigan State University

Stone, William J. (1967), Professor of Exercise and Wellness; B.S., Boston University; M.S., Florida State University; Ed.D., University of California, Berkeley

Strawn, Roland S. (1967), Professor Emeritus of Technology; B.S.E.E., M.S.E.E., University of Illinois; Ph.D., Arizona State University

Sundararajan, Rajeswari (1996), Associate Professor of Electronics and Computer Engineering Technology; B.S., University of Madras (India); M.S., Indian Institute of Science (India); Ph.D., Arizona State University

Swan, Pamela (1994), Assistant Professor of Exercise and Wellness; B.A., University of California, Santa Barbara; M.S., University of North Carolina, Greensboro; Ph.D., University of Tennessee

T

Taysom, Elvin D. (1953), Professor Emeritus of Agribusiness and Resource Management; B.S., University of Idaho; M.S., Utah State University; Ph.D., Washington State University

Thomason, Leslie L. (1969), Professor Emeritus of Technology; A.B., M.A., Ed.D., University of Oklahoma

Thor, Eric P. (1990), Professor of Agribusiness and Resource Management; B.S., M.S., Ph.D., University of California, Berkeley

Turney, Mary Ann (1999), Associate Professor of Aeronautical Management Technology; B.A., LeMoyne College; M.A., Hofstra University; Ed.D., Nova Southeastern University

V

Vaughan, Linda A. (1982), Professor of Nutrition; Chair, Department of Nutrition; B.S., University of California, Davis; M.N.S., Cornell University; Ph.D., University of Arizona

W

Watkins, Thomas B. (1972), Professor Emeritus of Technology; B.S., University of Wyoming; M.S., Arizona State University

Welty, Ellen L. (1996), Reference/Instruction Librarian, ASU East Library Services; B.A., University of Wyoming; M.L.S., University of Arizona

Wenhart, James C. (1996), Lecturer of Elementary Education; B.S., M.Ed., Arizona State University

Whysong, Gary L. (1974), Associate Professor of Environmental Resources; B.S., M.S., Montana State University; Ph.D., University of Wyoming

Wilson, Daniel (1978), Senior Lecturer of Information and Management Technology; B.S., Drexel University; M.S.E., Ph.D., Arizona State University

Wood, Billy G. (1977), Professor Emeritus of Electronics and Computer Engineering Technology; A.B., University of California; B.S., Eastern Illinois University; M.S., University of Arizona

Woodruff, Larry (1998), Lecturer of Exercise and Wellness; B.S., University of Oregon; M.S., Western Oregon University

Z

Zeng, Guoliang (1991), Associate Professor of Electronics and Computer Engineering Technology; B.S., Chengdu Telecommunication Institute (China); M.S., University of California, San Diego; M.N.S., Ph.D., Arizona State University

ASU East Administrative Personnel

Academic Administration

Campus Chief Executive Officer and Provost, ASU East; Vice President, ASU.....	Charles E. Backus
Vice Provost, Academic Programs	David E. Schwalm
Dean, Student Affairs.....	Gary L. McGrath
Director, Academic Services.....	C. Vinette Williams
Director, Administrative Services.....	Terry C. Isaacson
Director, American Indian Programs.....	Phillip J. Huebner
Director, Development	Judith L. Heasley
Director, Information Technology	Kati L. Weingartner
Interim Director, Institutional Advancement	C. Vinette Williams
Director, Library Services	Charles W. Brownson
Director, Planning and Budget	Sheila L. Ainlay
Director, Research and Sponsored Projects	Jean N. Humphries
Marley Foundation Chair in Consumer Food Marketing	Clifford J. Shultz
Coordinator, Sustainable Technologies, Agribusiness, and Resources Center	John H. Brock

College of Technology and Applied Sciences

Dean, College of Technology and Applied Sciences	Albert L. McHenry
Associate Dean, College of Technology and Applied Sciences.....	Lakshmi V. Munukutla
Assistant Dean, College of Technology and Applied Sciences.....	Dale E. Palmgren
Chair, Department of Aeronautical Management Technology	William K. McCurry
Chair, Department of Electronics and Computer Engineering Technology	Timothy E. Lindquist
Chair, Department of Information and Management Technology	Thomas E. Schildgen
Chair, Department of Manufacturing and Aeronautical Engineering Technology	Scott G. Danielson
Project Director, International Projects Institute.....	Gary M. Grossman

East College

Dean, East College.....	David E. Schwalm
Chair, Department of Nutrition	Linda A. Vaughan
Head, Faculty of Applied Psychology	Roger W. Schvaneveldt
Head, Faculty of Business Administration	Roger W. Hutt
Head, Faculty of Elementary Education	Bette S. Bergeron
Head, Faculty of Exercise and Wellness.....	William J. Stone
Head, Faculty of Multimedia Writing and Technical Communication	Barry M. Maid

Morrison School of Agribusiness and Resource Management

Dean, Morrison School of Agribusiness and Resource Management.....	Raymond A. Marquardt
Associate Dean, Morrison School of Agribusiness and Resource Management.....	George J. Seperich

ASU West

**Elaine P. Maimon, Ph.D., Campus Chief Executive Officer
and Provost, ASU West; Vice President, ASU**

www.west.asu.edu



Andrew Kirby (right), faculty advisor and professor of Social and Behavioral Sciences, assists a student.

Dave Tevis photo

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ASU West, a growing anchor campus of Arizona State University, serves diverse students who balance academics with the multiple demands of careers, family, and community service. More than 5,300 commuting students are enrolled in junior, senior, and graduate-level courses leading to 29 bachelor's degrees, nine master's degrees, and eight professional certificates. Starting in fall 2001, ASU West admits freshmen for the first time, beginning the transition to a full, four-year learning environment.

Through the award-winning University-College Center, some students take community college courses necessary for university transfer on the ASU West campus. Academic advising, child care, and evening tutoring for children of students are just a few examples of innovative services that help families achieve their educational goals. ASU West students enjoy a friendly, small-campus atmosphere while benefitting from the resources and expertise of a research-based, nationally acclaimed, PAC-10 university.

Academic programs are linked directly to community needs, providing relevant, applied learning opportunities, such as internships. Courses are offered through the Colleges of Arts and Sciences, Education, and Human Services and through the Division of Collaborative Programs and the School of Management.

ASU West offers many on-campus services and facilities, including a multimedia resource library, state-of-the-art computer classrooms and labs, tutoring services, bookstore, cafeteria, credit union, fitness center, recreational facilities, and post office, plus many student activities, clubs, and organizations. ASU West facilities are completely accessible for those with disabilities, with academic services provided by a disability resource center. Classes are offered in the day and evening, as well as on weekends, and via television and the Internet.

The architecture and courtyards at ASU West are modeled on those of the University of Oxford in Great Britain, enhanced by a beautifully landscaped natural environment featuring widely acclaimed public art. The campus occupies approximately 300 square acres between 43rd and 51st Avenues on West Thunderbird Road in Phoenix, easily accessed from Interstate 17 and Loop 101.

ACCREDITATION

ASU West is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools, 30 North LaSalle St., Chicago, IL 60602-2504.

Professional programs in various academic areas are also accredited.

The Business and Accountancy degree programs in the School of Management are accredited by the AACSB—the International Association for Management Education. The

ASU West Baccalaureate Degrees and Majors

Major	Degree	Concentration	Administered By
Accountancy	B.S.	—	School of Management
Administration of Justice	B.S.	—	College of Human Services
American Studies	B.A.	Emphases: American cultures, American lives, American systems, writing	College of Arts and Sciences
Applied Science	B.A.S.	All minors available at ASU West, individualized concentration	Division of Collaborative Programs
Communication Studies	B.A., B.S.	Emphases: communication and culture; communication and organizations; communication and relationships; rhetoric, philosophy, and media studies	College of Human Services
Elementary Education	B.A.E.	Bilingual education, early childhood education, English as a second language Option: middle school education	College of Education
English	B.A.	—	College of Arts and Sciences
Global Business	B.S.	Financial management, human resources management, information systems management, international studies, marketing	School of Management
History	B.A.	—	College of Arts and Sciences
Integrative Studies	B.A.	All minors available at ASU West, individualized concentration	College of Arts and Sciences
Interdisciplinary Arts and Performance	B.A.	Media, music, performance studies, theater/performance, visual art	College of Arts and Sciences
Life Sciences	B.S.	Emphases: cell biology and physiology, ecology and organismal biology, human biology and environment	College of Arts and Sciences
Nursing	B.S.N.	—	College of Nursing (ASU Main)
Politics	B.A., B.S.	—	College of Arts and Sciences
Psychology	B.A., B.S.	—	College of Arts and Sciences
Recreation and Tourism Management	B.S.	—	College of Human Services
Secondary Education	B.A.E.	Academic specializations: biological sciences, English, history, mathematics, social studies Option: middle school education	College of Education
Social and Behavioral Sciences	B.A., B.S.	Emphases: interdisciplinary behavioral sciences, interdisciplinary social sciences	College of Arts and Sciences
Social Work	B.S.W.	—	College of Human Services
Sociology	B.A., B.S.	—	College of Arts and Sciences
Spanish	B.A.	—	College of Arts and Sciences
Special Education	B.A.E.	—	College of Education
Women's Studies	B.A., B.S.	—	College of Arts and Sciences

Accountancy program is also an Endorsed Internal Auditing Program by the Institute of Internal Auditors.

In the College of Human Services, the Department of Recreation and Tourism Management is accredited by the National Recreation and Park Association/American Association for Leisure and Recreation, and the Bachelor in Social Work program is accredited by the Council on Social Work Education (CSWE). The Master in Social Work program is currently in candidacy for accreditation by the CSWE. Full accreditation is anticipated in 2002. See "Academic Accreditation at ASU West," page 694.

ACADEMIC ORGANIZATION AND ADMINISTRATION

As chief operating and academic officer of ASU West, the vice president and provost provides executive leadership for the continuing development and management of the campus and reports directly to the president of Arizona State University. The vice president and provost is aided in the administration of the campus by vice provosts, deans, directors, department chairs, faculty, and other officers. There are four schools and colleges at ASU West and a Division of Collaborative Programs administered by deans. These academic units develop and implement the teaching, research, and service programs of the institution, aided by the ASU West Fletcher Library and other services.

ASU West Graduate Degrees and Majors

Major	Degree	Concentration	Administered By
Business Administration	M.B.A.	—	School of Management
Communication Studies	M.A.	—	College of Human Services
Criminal Justice	M.A.	—	College of Human Services
Educational Administration and Supervision	M.Ed.	—	College of Education
Elementary Education	M.Ed.	Bilingual education, educational media and computers, ESL education, reading	College of Education
Interdisciplinary Studies	M.A.	—	College of Arts and Sciences
Secondary Education	M.Ed.	Educational media and computers	College of Education
Social Work	M.S.W.	—	College of Human Services
Special Education	M.Ed.	Infants and young children	College of Education

The faculty and students of the institution play an important role in campus governance, with the Academic Senate, Associated Students of ASU West, and numerous cross-campus and joint ASU West–ASU Main–ASU East committees serving the needs of a rapidly growing institution.

See “ASU West Administrative Personnel,” page 682, and “Academic Organization,” page 8.

ADMISSION AND ADVISING

Admission

Nondegree Students. Nondegree students may take courses at ASU West according to the special provisions under “Admission of Undergraduate Nondegree Applicants,” page 60.

Degree-Seeking Students. Any student admitted to ASU may take courses at ASU West. To be admitted to an ASU West degree program, the student must meet university admissions requirements and the specific admission requirements of the ASU West program. A student who is admitted to an ASU West degree program is defined as an ASU West student.

For more information on applying to ASU West degree programs, see the current *ASU West Catalog* or *ASU West Schedule of Classes*. For applications and admission information, call 602/543-8203, or write

ADMISSION SERVICES
UNIVERSITY CENTER BUILDING 120
ARIZONA STATE UNIVERSITY WEST
PO BOX 37100
PHOENIX AZ 85069-7100

Change of Major from ASU Main to ASU West

Currently enrolled ASU Main degree-seeking students who want to relocate to an ASU West degree program should contact the Admissions and Records Office at ASU West for the appropriate procedures. Acceptance to an ASU West degree program requires the student to meet the prerequisites for entry to the student’s choice of major as stated in the appropriate catalog. Students should be aware that certain requirements (e.g., the minimum number of upper-division semester hours to graduate) differ between ASU West and ASU Main. Students should therefore contact an academic advisor at West campus before relocating to ASU West.

Application of Course Credit. All courses completed on any ASU campus may fulfill the 120-semester-hour requirement for graduation with a baccalaureate degree. Every candidate for the baccalaureate degree is required to earn a minimum of 30 semester hours in resident credit courses at the ASU campus from which the student will graduate. Some degree programs have specific requirements that must be completed in the department of the major or through another department at the resident campus. The application of courses to the degree program is determined by the appropriate faculty member or academic advisor of the student’s major. Because of these constraints, students should seek advice from the appropriate advisor for their major before registering for classes at another ASU campus.

Academic Advising

Effective academic advising is an essential aspect of the educational experience at ASU West. Prospective students should contact a general advisor as a first step in the admission process to make an appointment, call 602/543-8217, or visit Transition and Outreach Services in UCB 201. A general counselor reviews admission requirements and processes and makes referrals to academic advisors as appropriate. A convenient alternative is to meet with an outreach advisor at an ASU West Transfer Center located on the campuses of local community colleges.

DEGREE PROGRAMS

Refer to the “ASU West Baccalaureate Degrees and Majors” table, page 669, “ASU West Graduate Degrees and Majors” table, on this page, and “ASU West Certificates” table, page 672.

The College of Education offers postbaccalaureate programs for teacher certification in elementary education and secondary education. Students who complete the approved program, including student teaching, are recommended for certification to the Arizona Department of Education. The following academic specializations for the B.A.E. degree in Secondary Education require course work in the subject matter area not currently available at ASU West (but offered at ASU Main): business education, chemistry, family resources and human development, physical education, physics, political science, and Spanish.

For more information on ASU West degree requirements, see the *ASU West Catalog*.

Minors and Certificates

ASU West offers an extensive selection of minors and certificate programs that may be taken in conjunction with a major. Other certificate programs may be taken independently; for the complete list, see the “ASU West Certificates” table, page 672, and the “ASU West Minors” table, page 671. For more information, refer to the individual department or college descriptions in the *ASU West Catalog*.

ASU Main Programs Hosted at ASU West. Courses for the Bachelor of Science in Nursing (B.S.N.) degree are offered at ASU West. For specific information on requirements, see “College of Nursing,” page 455.

Course Information

For information on ASU West course offerings, see the current *ASU West Schedule of Classes*. For ASU West course descriptions and General Studies courses offered at ASU West, see the *ASU West Catalog*.

Library Services

The ASU West Library provides resources that support the curriculum of the West Campus with a collection of 315,000 volumes, 1.4 million microforms, 7,500 videos, 15,000 slides, 170 electronic databases and more than 5,000 serial titles including 2,800 electronic full-text journals. Approximately 53% of electronic databases are available to ASU registered users from home computers.

The library is open seven days a week to meet the informational needs of the campus community. Knowledgeable staff members are available to provide reference service and instruction in the use of the library’s considerable resources.

Individual consultations with subject specialist librarians are available by appointment. The Library Instruction Program provides introduction to the tools and resources available for research in academic disciplines, including Internet resources.

A wide range of information and research tools—most accessible from off-campus—are available through the ASU West Library Web site at www.west.asu.edu/library. For library hours and information, call 602/543-5717.

ASU EXTENDED CAMPUS

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

The ASU Extended Campus goes beyond the boundaries of the university’s three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; and innovative delivery technologies including television, the Internet, and independent learning. The Extended Campus also offers a variety of professional continuing education and community outreach programs.

For more information, see “ASU Extended Campus,” page 683, or access the Web site at www.asu.edu/xed.

ASU West Minors

Minor	Administered By
American Studies	Department of American Studies
Communication Studies	Department of Communication Studies
English	Department of American Studies
Ethnic Studies	Ethnic Studies Program
Film and Video Studies	Department of Interdisciplinary Arts and Performance
Gerontology	Gerontology Program
History	Department of American Studies
Interdisciplinary Arts and Performance	Department of Interdisciplinary Arts and Performance
Life Sciences	Department of Life Sciences
Mathematics	Department of Integrative Studies
Philosophy	Department of Integrative Studies
Politics	Department of Social and Behavioral Sciences
Prelaw	College of Human Services
Psychology	Department of Social and Behavioral Sciences
Religious Studies	College of Arts and Sciences
Social and Behavioral Sciences	Department of Social and Behavioral Sciences
Sociocultural Anthropology	Department of Social and Behavioral Sciences
Sociology	Department of Social and Behavioral Sciences
Spanish	Department of American Studies
Special Events Management	Department of Recreation and Tourism Management
Tourism Management	Department of Recreation and Tourism Management
Women’s Studies	Women’s Studies Program

ASU West Certificates

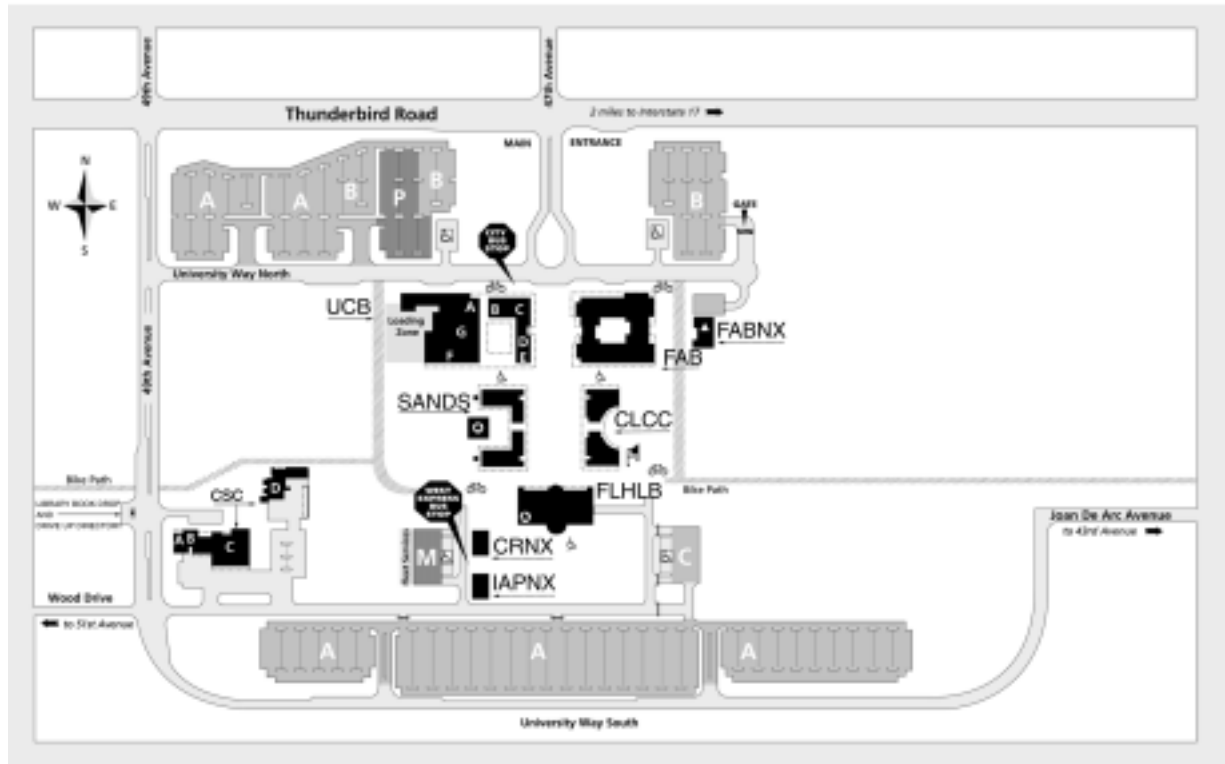
Certificate	Administered By
Accountancy, Postbaccalaureate Certificate in	School of Management
Communication and Human Relations, Postbaccalaureate Certificate in	College of Human Services
Ethnic Studies Certificate	College of Arts and Sciences
Film and Video Studies Certificate	College of Arts and Sciences
Gerontology Certificate	College of Human Services
Professional Accountancy, Postbaccalaureate Certificate in	School of Management
Women's Studies Certificate	Women's Studies Program
Writing Certificate	Department of American Studies



The area's pleasant climate affords university groups, such as this ASU West Women's Studies class, the opportunity to meet outdoors.

Dave Tevis photo

ASU West Map











University Center Building (UCB)

Admission Services
 Arizona State Savings and Credit Union
 Bank of America ATM
 Bookstore
 Cafeteria
 Career Services/Personal Counseling Center
 Cashier's Office
 Child Care Center
 Disability Resource Center
 Division of Collaborative Programs
 Financial Aid/Student Employment Information Desk
 La Sala A, B, C
 Multicultural Student Services
 Parking Office
 Registration Services
 Second Stage West Theatre
 Student Affairs Administration
 Student Health Services
 Student Life
 Student Support Services Program
 Transition and Outreach Services
 Tutoring Services
 University-College Center
 Veteran Services
 Wellness/Fitness Center
 Women's Resource Center

Faculty/Administration Building (FAB)

Academic Affairs
 Academic/Faculty Offices
 Basement Classrooms
 College of Arts and Sciences
 Education
 Human Services
 Copy Center
 Information Technology
 Instructional Technology Lab
 Information Desk
 Institutional Advancement
 Office of the Provost
 School of Management
FAB Annex (FABNX)
 Administrative Affairs
 Human Resources
Classroom Lab/Computer Classroom Building (CLCC)
Fletcher Library (FLHLB)
 Center for Writing Across the Curriculum
 Technopolis
Sands Classroom Building (SANDS)
 Copy Express
 Kiva Lecture Hall
 Sand Trap Snack Bar
Interdisciplinary Arts Annex (IAPNX)
Classroom Annex (CRNX)
Central Services Complex (CSC)

Map Symbols Legend

-  Disabled Parking
-  Disabled Decal Parking
-  Metered Parking (25 cents per 15 minutes)
-  Visitor Parking (\$1.00 exit fee; 24 hours)
-  Decal Parking (Students, faculty, and staff only)
-  Faculty/Staff Decal Parking (7 a.m.–5:30 p.m., student decal parking after 5:30 p.m.)
-  Faculty/Staff Decal Parking (24 hours/day)
-  Bicycle Racks
-  Accessible Ramp

Parking regulations are enforced at all times.
 Decals are required on campus 7 a.m.–11 p.m.
 Meters are enforced from 7 a.m.–10 p.m.

ASU West Directory

For the "ASU Main Directory," see page 522. For the "ASU East Directory," see page 662. For the "ASU Extended Campus Directory," see page 691.

Organization	Location	Telephone	Web Address
Academic Units (Administrative and Faculty Offices)			
Arts and Sciences, College of	FAB N201	602/543-6000	www.west.asu.edu/coas
American Studies, Department of	FAB N220B	602/543-6090	www.west.asu.edu/amerstud
Ethnic Studies Program	FAB N204	602/543-6007	www.west.asu.edu/ethnic
Integrative Studies, Department of	FAB N279-1	602/543-6003	www.west.asu.edu/iasweb/index.html
Interdisciplinary Arts and Performance, Department of	FAB N230F	602/543-6057	www.west.asu.edu/iap
Life Sciences, Department of	CLCC 210	602/543-6050	www.west.asu.edu/lifesci
M.A. Interdisciplinary Studies	FABN 201F	602/543-6241	www.west.asu.edu/mais
Social and Behavioral Sciences, Department of	FAB N250	602/543-6058	www.west.asu.edu/social
Women's Studies Program	FAB N291	602/543-3300	www.west.asu.edu/wsteam
Collaborative Programs, Division of	UCB 201	602/543-4600	www.west.asu.edu/dcp
Bachelor of Applied Science Program	UCB 201	602/543-4BAS	www.west.asu.edu/bas
Barrett Honors College	UCB 201	602/543-4503	www.asu.edu/honors
Native American Programs	UCB 201	602/543-8138	www.west.asu.edu/stuaffairs/nativeamprograms.htm
Research Consulting Center	UCB 201	602/543-3410	www.west.asu.edu/rcc/lab/index.htm
Transition and Outreach Services	UCB 201	602/543-8217	www.west.asu.edu/tos
University-College Center	UCB 201	602/543-4222	www.west.asu.edu/ucc/
Writing Across the Curriculum, Center for	FLHLB LL2	602/543-6151	www.west.asu.edu/cwac/
Education, College of	FAB S210A	602/543-6300	www.west.asu.edu/coe
Human Services, College of	FAB S105-A	602/543-6600	www.west.asu.edu/chs
Administration of Justice, Department of	FAB S270C-1	602/543-6607	www.west.asu.edu/chs/aoj
Communication Studies, Department of	FAB S141C	602/543-6606	www.west.asu.edu/chs/comm
Gerontology Program	FAB S170-2	602/543-6642	www.west.asu.edu/chs/GRN
Nursing (ASU Main Program)	FAB N290A-2	602/543-6605	www.west.asu.edu/chs/nur
Recreation and Tourism Management, Department of	FAB S115A	602/543-6603	www.west.asu.edu/chs/RTM
Social Work, Department of	FAB S149	602/543-6602	www.west.asu.edu/chs/sw
Library, Fletcher	FLHLB	602/543-5717	www.west.asu.edu/library
Management, School of	FAB N101	602/543-6200	www.west.asu.edu/som
Accountancy Program	FAB S190	602/543-6275	www.west.asu.edu/som/acct
Master of Business Administration Program	FAB N151	602/543-6201	www.west.asu.edu/som/MBA
Undergraduate Global Business Program	FAB N101	602/543-6200	www.west.asu.edu/som/global
Others			
Admission Services	UCB 120	602/543-8203	www.west.asu.edu/asuw2/admcosts
Associated Students of ASU West	UCB 221	602/543-8186	www.west.asu.edu/asasuw
Bookstore	UCB 140	602/543-6800	www.west.asu.edu/adaff/auxs/book.html
Career Services and Personal Counseling Center	UCB 320	602/543-8124	www.west.asu.edu/stuaffairs/cspc
Disability Resource Center	UCB 130	602/543-8145	www.west.asu.edu/stuaffairs/drc
TDD	—	602/543-4327	—
Financial Aid Services	UCB 120	602/543-8178	www.west.asu.edu/stuaffairs/fa/safs.html
Graduate Studies	FAB S 301	602/543-4567	www.west.asu.edu/graduate/

Organization	Location	Telephone	Web Address
Information Desk	FAB Lobby	602/543-5500	www.west.asu.edu/adaff/auxs/infodsk.html
Multicultural Student Services	UCB 220	602/543-8148	www.west.asu.edu/stuaffairs/multicultural
Parking Services (Decals, Appeals)	UCB 105	602/543-7275	www.west.asu.edu/adaff/auxs/parking
Residency Classification	UCB 120	602/543-8203	www.asu.edu/registrar/residency
Student Employment	UCB 120	602/543-8178	www.west.asu.edu/stuaffairs/fa/stdemploy.htm
Student Health Services	UCB 170	602/543-8019	www.west.asu.edu/stuaffairs/studenthealth
Student Life	UCB 221	602/543-8200	www.west.asu.edu/stuaffairs/studentlife
Student Support Services Program	UCB 220	602/543-8121	www.west.asu.edu/stuaffairs/sasssp.html
Testing Services	UCB 120	602/543-8136	www.west.asu.edu/stuaffairs/testing
Transition and Outreach Services (General Advising)	UCB 201	602/543-8217	www.west.asu.edu/tos
Tutoring Services	UCB 322	602/543-8068	www.west.asu.edu/stuaffairs/multicultural/programs/ tutoring
Veteran Student Services	UCB 120	602/543-8220	www.west.asu.edu/stuaffairs/sava.html
Vice President/Provost	FAB N303	602/543-7000	—
Vice Provost, Academic Affairs	FAB N301	602/543-4500	www.west.asu.edu/asuw/academic/aa/org.htm
Women's Studies Resource Center	UCB 323	602/543-3421	www.west.asu.edu/wsteam/resource.htm

ASU West Faculty and Academic Professionals

A

Abramson, Marianne (1999), Visiting Assistant Professor of Psychology; B.A., Northern Arizona University; M.A., Ph.D., Arizona State University

Achilles, Elayne R. (1986), Associate Professor of Education; B.M.Ed., Temple University; M.M., Ed.D., Arizona State University

Ackroyd, William S. (2000), Lecturer of Social and Behavioral Sciences; B.A., M.A., M.S., Portland State University; Ph.D., University of Arizona

Aguñaga, José (1999), Assistant Librarian; B.A., University of San Diego; M.L.S., University of Arizona

Aleshire, Peter (1993), Senior Lecturer of Professional Writing; B.A., M.A., Stanford University

Andereck, Kathleen L. (1993), Associate Professor of Recreation and Tourism Management; B.S., University of Wisconsin, Stevens Point; M.S., Texas A&M University; Ph.D., Clemson University

Anders, Gary C. (1989), Professor of Economics; Director, Institute for International Business, School of Management; B.S., West Texas State University; M.A., Ph.D., University of Notre Dame

Anderson, Laurel A. (1989), Associate Professor of Marketing; B.S.N., University of Minnesota, Twin Cities; M.N., University of Washington; Ph.D., Arizona State University

Anokye, Akua Duku (1999), Visiting Associate Professor of American Studies; B.A., Michigan State University; M.A., Federal City College, District of Columbia; M.A., Ph.D., City University of New York Graduate School and University Center

Armstrong, Gaylene S. (2000), Visiting Assistant Professor of Administration of Justice; B.A., University of Manitoba (Canada); M.A., Ph.D., University of Maryland

Armstrong, Todd A. (1999), Assistant Professor of Administration of Justice; B.A., M.A., Ph.D., University of Maryland, College Park

Atwater, Leanne E. (1993), Professor of Management; B.A., M.A., San Diego State University; Ph.D., Claremont Graduate School

Ávalos, Manuel (1990), Associate Professor of Political Science; B.A., M.A., University of Arizona; Ph.D., University of New Mexico

Awender, Michael A. (2000), Professor of Education; Dean, College of Education; B.A., M.A., University of Windsor (Canada); M.Ed., University of Toronto (Canada); Ph.D., Claremont Graduate School

B

Baldwin, Bruce A. (1989), Professor of Accountancy; B.A., M.B.A., Michigan State University; Ph.D., Arizona State University

Balthazard, Pierre A. (1999), Associate Professor of Information Management Systems; B.S., McGill University (Canada); M.S., Ph.D., University of Arizona

Beckett, E. Carol (1996), Assistant Professor of Bilingual Education; B.A., M.Ed., Ed.D., Arizona State University

Bellizzi, Joseph A. (1988), Professor of Marketing; B.S., M.A., Ph.D., University of Nebraska, Lincoln

Berman, Tressa (1995), Assistant Professor of Anthropology; B.A., San Francisco State University; M.A., University of Colorado, Boulder; Ph.D., University of California, Los Angeles

Bernat, Frances P. (1993), Associate Professor of Administration of Justice; B.S., M.A., J.D., State University of New York, Buffalo; Ph.D., Washington State University

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Dean, College of Extended Education	Bette F. DeGraw
Dean, Craig and Barbara Barrett Honors College	Ted Humphrey

College of Arts and Sciences

Dean, College of Arts and Sciences.....	Thomas J. Keil
Cochair, American Studies	Candice Bredbenner
Cochair, American Studies	Dorothy C. Broaddus
Chair, Integrative Studies	Linda L. Stryker
Chair, Interdisciplinary Arts and Performance	Robert Taylor
Chair, Life Sciences.....	Harvey F. Pough
Chair, Social and Behavioral Sciences.....	Paul A. Miller
Chair, Women's Studies.....	Astair G. M. Mengesha
Director, M.A. Interdisciplinary Studies Program	Andrew Kirby

College of Education

Dean, College of Education.....	Michael A. Awender
Assistant Dean, College of Education	Ray R. Buss

College of Human Services

Dean, College of Human Services	Mark S. Searle
Chair, Administration of Justice	Vincent J. Webb
Chair, Communication Studies	Lesley Di Mare
Chair, Recreation and Tourism Management	Richard Gitelson
Liaison, Nursing (ASU Main Program)	Lasca Beck
Chair, Social Work	Melissa R. Lavitt
Director, Gerontology Program.....	Janet Shirreffs
Director, Partnership for Community Development	John T. Hultsman

Division of Collaborative Programs

Dean, Division of Collaborative Programs.....	Emily F. Cutrer
Coordinator, Bachelor of Applied Science Program	Cynthia Rasmussen
Coordinator, Transition and Outreach Services	Deborah S. Moore
Coordinator, University College Center	Christina Hahn
Director, Center for Writing Across the Curriculum Program	Robert W. Jones
Director, Research Consulting Center	Joseph M. Ryan
Liaison, Barrett Honors College.....	Joseph M. Ryan

School of Management

Dean, School of Management.....	Bruce Forster
Director, Accountancy Program.....	William Duncan
Director, Institute for International Business.....	Gary Anders
Director, Master of Business Administration Program	David Van Fleet
Director, Undergraduate Global Business Program	John Greenhut

ASU Extended Campus

Bette F. DeGraw, D.P.A., Dean, College of Extended Education

www.asu.edu/xed



ASU Downtown Center

Tim Trumble photo

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PURPOSE

The College of Extended Education was created in 1990 to extend the resources of ASU throughout Maricopa County, the state, and the region. The College of Extended Education is a university-wide college that oversees the ASU Extended Campus and forms partnerships with other ASU colleges to meet the instructional and informational needs of a diverse community.

For the most current information, visit the college's Web site at www.asu.edu/xed.

ASU EXTENDED CAMPUS

The ASU Extended Campus goes beyond the boundaries of the university's three physical campuses to provide access to quality academic credit and degree programs for working adults through flexible schedules; a vast network of off-campus sites; classes scheduled days, evenings, and weekends; plus innovative delivery technologies including television, the Internet, and independent learning. The ASU Extended Campus also offers a variety of professional continuing education and community outreach programs.

DEGREE PROGRAMS

ASU offers degree programs through the ASU Extended Campus. Convenient times and locations as well as today's innovative technologies make it easier for working adults and other nontraditional students to earn a degree. The College of Extended Education facilitates the delivery of these programs. All courses and degrees are offered through the respective university academic departments. These courses are published each fall and spring semester in the *Extended Campus Catalog* and in the *Schedule of Classes*. All degree programs offered through the college are shown in the "Baccalaureate Degrees and Majors Offered Through the College of Extended Education" table, page 685, and the "Graduate Degrees and Majors Offered in Collaboration with the College of Extended Education" table, page 686.

Undergraduate Degrees

OFF-CAMPUS DEGREE PROGRAMS

Interdisciplinary Studies—B.I.S.

ASU Main. This interdisciplinary degree completion program enables students to take an active role in creating their educational plan and defining their career goals. The program is offered for selected corporate and municipal employees. It emphasizes self-assessment and appraisal of

opportunities to support academic and career goals. For more information, call 480/965-9797 or write

COLLEGE OF EXTENDED EDUCATION
ACADEMIC AND PROFESSIONAL PROGRAMS
ARIZONA STATE UNIVERSITY
PO BOX 874001
TEMPE AZ 85287-4001

Housing and Urban Development—B.S.D.

ASU Main. The faculty in the School of Planning and Landscape Architecture in the College of Architecture and Environmental Design offer this degree primarily at the ASU Downtown Center, although some courses may be available at other locations and via cable television. See the fall and spring issues of the *Extended Campus Catalog* for complete scheduling information. For program information, call 480/965-7167 or write

SCHOOL OF PLANNING AND LANDSCAPE
ARCHITECTURE
ARIZONA STATE UNIVERSITY
PO BOX 872005
TEMPE AZ 85287-2005

Elementary Education—B.A.E.

ASU Main. This off-campus degree program is targeted to school district audiences. To learn more, call 480/965-1644.

Social Work—B.S.W.

ASU Main. The School of Social Work offers this degree in Tucson. This program is grant-funded for a five-year period and offers a part-time curriculum designed to increase the number of trained child welfare social workers in the rural areas of Arizona. For more information, call 520/884-5507, extension 19.

Applied Science (B.A.S.) and Integrative Studies (B.A.)

ASU West. Because of overlapping degree requirements and the flexibility built into each program, ASU West, working through the College of Extended Education, offers the same set of courses to meet the degree completion needs of students who bring differing educational experiences to the classroom. Thus, students who have completed an Associate of Applied Science (A.A.S.) degree could enroll in the B.A.S. degree program. Students entering the program with Associate of Arts (A.A.) degrees or some other combination of courses that totals 60 semester hours and encompasses the equivalent of the ASU General Studies requirement could receive the B.A. degree in Integrative Studies upon program completion. Both sets of students follow the same program of study.

Both degree programs emphasize focused study in critical thinking, communication, and leadership skills and include individual and team problem-solving experiences. Both include courses designed to refresh students' academic skills and to develop the resources to succeed in their educational pursuits.

Concentration areas, under the Bachelor of Applied Science (B.A.S.) at ASU West, are developed by the advisor and student based on educational goals and interests. The West Campus B.A.S. core curriculum is focused on the arts,

computers, writing, ethics, and career development. For more information on the West Campus B.A.S., call 602/543-4BAS or access the Web site at www.west.asu.edu/bas.

The Bachelor of Arts degree in Integrative Studies (B.A.) is an upper-division arts and sciences degree. Students are expected to read, write, and think critically which enables them to pursue postbaccalaureate employment, or graduate and professional degrees, in the broadest possible array of fields and specialization. This is a classical liberal arts degree, taught by interdisciplinary scholars in a student-oriented and lifelong learning fashion. Small classes and systematic assessment and feedback are defining characteristics of the program. Students complete 21 semester hours, including a gateway course in Adult Career Development; a capstone internship experience; and academic seminars in ethics, social and environmental theory; history and philosophy of sciences/mathematics; and multicultural perspectives on autobiographies, literature, and art. Students select one of the established minors or construct with a faculty advisor an area of academic concentration to complement the core curriculum with an additional 18 to 21 semester hours. For more information on the West Campus B.A., call 602/543-6000 or access the Web site at www.west.asu.edu/iasweb.

ASU East. Students holding an Associate of Applied Science (A.A.S.) degree from a regionally accredited community college can earn the Bachelor of Applied Science (B.A.S.) degree by completing 60 semester hours of upper-division course work through ASU East.

This degree is practical and flexible. ASU East faculty and advisors work with students to match a 60-semester-hour program of study to their individual interests and career goals, or students may select one of the concentrations shown in the "Baccalaureate Degrees and Majors Offered Through the College of Extended Education" table, page 685.

For more information, call 480/727-1874.

TECHNOLOGY-SUPPORTED DEGREE PROGRAMS

History—B.A.

ASU Main. The faculty of the Department of History offer the B.A. degree completion program in History via technology. (Students are required to take two of the courses on campus in the evening.) For more information, call 480/965-8364.

ON-CAMPUS EVENING DEGREE PROGRAMS

CLAS Bachelor's Degree Programs

ASU Main. Students who enroll in the College of Liberal Arts and Sciences (CLAS) evening degree program typically have completed 60 lower-division semester hours. They may pursue a Bachelor of Arts degree in English, History, Political Science, Sociology, or Psychology, or a Bachelor of Science degree in Political Science or Psychology. For more information, call 480/965-3986 and request "degree programs."

Communication—B.A. or B.S.

ASU Main. The faculty in the Hugh Downs School of Human Communication offer the B.A. and B.S. degrees in

Baccalaureate Degrees and Majors Offered Through the College of Extended Education

Major	Degree	Concentration	Administered By
Applied Science	B.A.S.	Aviation maintenance management technology, aviation management technology, computer systems administration, consumer products technology, digital media management, digital publishing, emergency management, fire service management, food retailing, instrumentation, microcomputer systems, multimedia writing and technical communication, municipal operations management, operations management, production technology, resource team specialist, semiconductor technology, software technology applications, technical graphics All minors available at ASU West, individualized concentration	Bachelor of Applied Science Advisory Committee (ASU East) Division of Collaborative Programs (ASU West)
Communication	B.A., B.S.	—	Hugh Downs School of Human Communication
Elementary Education	B.A.E.	Bilingual education/English as a second language	Division of Curriculum and Instruction
English	B.A.	Linguistics, literature	Department of English
History	B.A.	—	Department of History
Housing and Urban Development	B.S.D.	—	School of Planning and Landscape Architecture
Integrative Studies	B.A.	All minors available at ASU West, individualized concentration	College of Arts and Sciences (ASU West)
Interdisciplinary Studies	B.I.S.	See the “B.I.S. Concentrations” table, page 109.	Bachelor of Interdisciplinary Studies Advisory Committee
Political Science	B.A., B.S.	American public policy, civic education, international studies, public policy advocacy and lobbying, public policy analysis	Department of Political Science
Psychology	B.A., B.S.	—	Department of Psychology
Social Work	B.S.W.	—	School of Social Work
Sociology	B.A.	—	Department of Sociology

Communication through the College of Extended Education’s Evening Degree Program. For more information, call 480/965-5095.

Graduate Degrees

OFF-CAMPUS DEGREE PROGRAMS

Business Administration—M.B.A.

ASU Main. The technology M.B.A. is an evening program designed specifically for technology professionals. The degree program is offered at the ASU Research Park. Cases, applications, and examples emphasize technology, global competition, and rapid organizational change. For more information, call 480/965-3332.

The evening M.B.A. is offered at the ASU Downtown Center. It is designed to meet the needs of working professionals and combines theoretical concepts with practical applications. For more information, call 480/965-3332.

ASU West. The Scottsdale M.B.A. degree program meets in the Scottsdale Airpark in north Scottsdale. Classes emphasize the development of critical learning skills, with practical application in analyzing local industries. Students, faculty, and industry experts work together on projects for

local companies. The integrated curriculum provides a comprehensive understanding of interrelated business issues. For more information, call 602/543-6201.

Public Administration—M.P.A.

ASU Main. The School of Public Affairs offers this interdisciplinary program. The program is designed to provide professional training for careers in public administration and management. Opportunities for completing course work leading to the M.P.A. are offered during evening hours at ASU Main, the ASU Downtown Center, and various off-campus sites. For more information, call 480/965-3926 or write

SCHOOL OF PUBLIC AFFAIRS
ARIZONA STATE UNIVERSITY
PO BOX 870603
TEMPE AZ 85287-0603

Curriculum and Instruction—M.Ed.

ASU Main. The Master of Education degree in Curriculum and Instruction is offered with a concentration in secondary education. This is an off-campus degree program targeted to school district audiences. For more information, call 480/965-1644.

Graduate Degrees and Majors Offered in Collaboration with the College of Extended Education

Major	Degree	Concentration	Administered By
Business Administration	M.B.A.	—	College of Business (ASU Main) School of Management (ASU West)
Curriculum and Instruction	M.Ed.	Secondary education	College of Education
Educational Administration and Supervision	Ed.D.	—	College of Education
Electrical Engineering	M.S.E.	—	College of Engineering and Applied Sciences
Engineering	M.E.*	—	School of Engineering
Public Administration	M.P.A.	Public information management, public management, public policy analysis and evaluation, urban management and planning	School of Public Affairs

* This collaborative program is offered by the three state universities.

DELTA Doctorate

ASU Main. The DELTA Doctorate, which leads to the Doctor of Education degree in Educational Administration and Supervision, is available as an off-campus degree program. The program is targeted to qualified public school administrators. For more information, call 480/965-6357.

TECHNOLOGY-DELIVERED DEGREE PROGRAMS

Electrical Engineering—M.S.E.

ASU Main. The faculty in the Department of Electrical Engineering offer the Master of Science in Engineering degree in Electrical Engineering via interactive television. This program meets the needs of the part-time student who is working full-time in industry. Ten graduate courses are required; six should constitute a major, two courses a minor, and two courses should be taken outside the Department of Electrical Engineering. After completing the required hours of course work, students in this program must pass a comprehensive examination covering topics in the major. Using the department's three-year schedule of courses, students are able to complete course requirements over the interactive television system. For more information, call 480/965-3590.

Business Administration—M.B.A.

ASU Main. The ASU MBA Online program leverages computer and communications technologies to offer the highly ranked ASU M.B.A. to managers and professionals who do not wish to attend a traditional, on-campus program. The program consists of on-site sessions, asynchronous technology-based materials, and electronic communication among faculty and students. This two-year program consists of 12 four-semester-hour courses. For more information, call 480/965-3332.

ASU West. The connectMBA from ASU West allows working professionals to complete a quality, AACSB-accredited M.B.A. without weekly attendance on campus. Course delivery combines classroom instruction (every seventh weekend) with self-paced, computer-assisted learning. The two-year program consists of 15 three-semester-hour courses. For more information, access the Web site at www.west.asu.edu/som/mba.

ENGINEERING—M.E.

ASU Main. The tri-university Master of Engineering degree program is intended to meet the educational needs of Arizona's practicing engineers. With industry input, Arizona's three state universities—Arizona State University, Northern Arizona University, and University of Arizona—enhance the skills, knowledge, and understanding that are critical to today's practicing engineers. The courses are offered through a variety of distance-delivery methods in flexible formats at any of the three universities.

The M.E. degree offers the practicing engineer opportunities to design, in conjunction with an advisory committee, a program of study that can reflect the increasingly interdisciplinary nature of engineering practice. The M.E. degree requires the completion of 30 semester hours of course work; students must complete a minimum of three hours in applied engineering mathematics as well as three hours of engineering management/business. Up to six semester hours from a practice-oriented project may be applied. A final examination is required.

For application information, call 480/965-1726, send e-mail to m.eng@asu.edu, or access the program's Web site at triuniv.engr.arizona.edu.

ON-CAMPUS EVENING DEGREE PROGRAM

Public Administration—M.P.A.

ASU Main. The School of Public Affairs offers this interdisciplinary program. The program is designed to provide professional training for careers in public administration and management. Opportunities for completing course work leading to the M.P.A. are offered during evening hours at ASU Main, the ASU Downtown Center, and various off-campus sites. For more information, call 480/965-3926 or write

SCHOOL OF PUBLIC AFFAIRS
ARIZONA STATE UNIVERSITY
PO BOX 870603
TEMPE AZ 85287-0603

WINTER SESSION (MAIN)

The College of Extended Education schedules the winter session courses in collaboration with academic departments.

The condensed, three-week session is offered between the fall and spring semesters. For more information about winter session, call 480/965-9797.

Certificate Programs

Certificate programs provide opportunities for those seeking to advance their careers, to begin a new career, to reenter the workplace, or simply to develop new knowledge. A practical choice for career development, certificate programs are recognized by employers as evidence of professional skill or accomplishment.

Business English Certificate Program

Designed to help international students and professionals succeed in the world of business, this new program offers five courses that use reading, writing, and discussion exercises to gain practical knowledge of and confidence in American and international business practices. Once students successfully complete three certificate courses, they earn a Business English Certificate. If they wish to complete all five classes, they earn an Advanced Business English Certificate. The program's courses are international business, business decisions, business writing, business communications, and TOEIC test preparation. Classes are ongoing and meet several hours a week for eight weeks. For more information, call the American English and Culture Program at 480/965-2376.

This certificate is not for academic credit.

English as a Second Language Certificate

The American English and Culture Program offers a certificate in the study of English as a second language (ESL), comprising 21 hours a week for eight weeks of language and culture training.

This certificate is not for academic credit.

Gerontology Certificate Program

The Certificate in Gerontology, offered by the Graduate College, is available to graduate students enrolled in master's or doctoral degree programs in disciplines such as communication, exercise science, nursing, psychology, social work, and sociology. Unclassified graduate students may pursue the certificate. This program consists of 24 semester hours evenly divided between required and elective course work.

The Gerontology Program has an affiliated faculty of more than 60 members based in 22 different departments throughout the university. Students can work on independent study or participate with faculty in their aging-related research.

Because of increased longevity, there could be more than 30 million Americans over the age of 85 by 2040, a demographic change with many ramifications. The certificate is designed for individuals interested in learning more about the aging process. For more information, call 480/965-3225 (ASU Main) or 602/543-6642 (ASU West).

Human Performance Improvement Certificate Program

The Human Performance Improvement Certificate Program is offered by the College of Extended Education and the American Society of Training and Development. This program is designed to provide a well-rounded understanding of the human performance improvement field for those

in a human resource capacity. Individuals can receive a Human Performance Improvement Certificate after completing the six courses of the program or may elect to enroll in one or more classes on a per-class basis. For more information, call 480/965-9200.

This certificate is not for academic credit.

Nonprofit Management Certificate Program

The Nonprofit Management Institute is offered by the College of Extended Education and the United Way. This program is designed to enhance the management skills of those who serve nonprofit human services groups, hospitals, government agencies, churches, private schools, art organizations, environmental groups, and others in the nonprofit sector.

Individuals can receive a Certificate in Nonprofit Management along with 13 Continuing Education Units after completing 130 hours of the program. The individual class option permits participants to enroll in one or more classes on a per-class basis. Additional full- and half-day workshops are also provided to help those in the nonprofit sector achieve excellence in managing nonprofit organizations. For more information, call 480/965-9200.

This certificate is not for academic credit.

College Units by Program Area

Degree Programs and Credit Courses

The College of Extended Education facilitates the delivery of several degree programs and credit courses. Convenient times and locations as well as today's innovative technologies make it easier for working adults and other nontraditional students to earn a degree. All courses and degrees are offered through the respective university academic departments. These courses are published each fall and spring semester in the *Extended Campus Catalog* and the *Schedule of Classes*.

Academic and Professional Programs. As a convenience to students, courses are conducted off campus in locations throughout the state, and on campus in the evening and during the winter session.

Academic credits earned off campus are recorded on a student's permanent record in the same manner as those earned on campus and are equivalent in all academic considerations. All academic standards of the university, including policies related to admission and registration, apply to off-campus courses. It is the responsibility of the student to be aware of all applicable policies before registering. It is the responsibility of each dean to determine what courses to offer off campus and to make faculty assignments.

The tuition and fees for off-campus credit courses are the same as for those offered on campus. (See resident and non-resident rates in the latest *Schedule of Classes*.) Before the 21st calendar day of each semester, any combination of on-campus and off-campus resident credit courses resulting in a combined registration of seven or more semester hours requires that the student pay full-time tuition. Off-campus credit courses and programs that commence on or after the 21st calendar day of the start of each semester require full-time and part-time students to pay tuition separate from (but in addition to) those courses starting before the 21st calendar day of the semester.

Professional continuing education activities focus on professional and personal development as well as lifelong learning. Programs are planned and developed to complement the missions of the college and the university. These programs can be customized and transported to reach numerous target populations and levels of need.

Distance Learning Technology. Distance Learning Technology uses a variety of technologies. Semester-based courses are offered through Instructional Television Fixed Service, cable television, public television, satellite, microwave, videotape, and the Internet. In addition, independent learning courses are offered (print- or Internet-based). Distance Learning Technology makes it possible for many people to access and share educational resources locally, regionally, nationally, and internationally through a variety of electronic technologies and distribution systems. In addition to distance learning courses, other products and services are available, including teleconferencing and video production.

Many students are unable to attend class on campus due to schedule or commuting difficulties and prefer to participate in distance learning courses at convenient locations such as the work site or home. The distance learning course schedule consists of approximately 135 courses offered by various ASU colleges each semester, and these courses are available for credit at a variety of remote locations, including students' homes. Students participating in televised courses from the work site or home can interact with faculty and students in the classroom on campus while class is in session via teleconferencing technology. Videotapes of most courses are available through University Libraries Video Resources. Other student support services are available to assist off-campus students.

Cable/Public Television. ASU offers credit courses that require students to view televised class sessions and complete work assignments at home. Exams usually are held on campus. Courses are available throughout the Phoenix area via KAET Channel 8, Cox Communications, Insight Cable, Cable America, Digital Choice TV, and other cable providers. Televised courses are also available in university residence halls.

Interactive Instructional Television Program (IITP). Students employed by companies participating in the IITP may take courses for credit at the work site. A daily courier service circulates course materials between faculty on campus and their students at remote sites. Exams typically are held at the work site. Each company has an on-site coordinator to assist with registration, to provide information, and to proctor exams. A Master of Science in Engineering degree with a major in Electrical Engineering is available through the IITP. More information about the degree is available from the College of Engineering and Applied Sciences at 480/965-6738.

Interactive Television (Public Sites). Certain sites are open to the public. Students can participate in most televised courses at locations such as ASU Downtown Center, ASU East, ASU West, select community college campuses, Cactus Shadows High School, and the Gila River Indian Community. Each public site has an on-site coordinator to assist with registration, to provide information, and to proctor exams.

Internet Courses. ASUonline is the university's gateway to an "online campus." Internet courses are offered by various departments through ASU Extended Campus, allowing students to participate from any location in the world. Through the Web, students can access lectures, participate in class assignments, interact with the instructor, collaborate with other students, and earn ASU credit at convenient times and locations. Students register for Internet courses through the normal university admissions and registration process. Certain computer hardware and software may be required for Internet courses. For more information about Distance Learning Technology, call 480/965-6738, or access the Web site at asuonline.asu.edu.

Independent Learning. These courses allow students to pursue ASU credit and to fulfill degree requirements or to enhance occupational, professional, and intellectual skills. Independent Learning courses are appropriate for students seeking flexibility in progressing through university courses. Any individual with a high school diploma or GED may enroll; however, enrollment in Independent Learning is not the same as admission to ASU. For ASU degree-seeking students, enrollment in these courses requires an advisor's and dean's approval. Generally, ASU students may take one course at a time—other students can participate in two. A maximum of 60 semester hours earned by independent learning and/or by comprehensive examination may be applied toward the baccalaureate degree at ASU. Independent Learning courses are not applicable toward graduate credit, and pass/fail options are not available. Students have up to one year to complete courses. More information on registration, lesson formats, submission of assignments, correspondence with instructors, and other course details is available in a catalog from the Independent Learning office, at 480/965-6563.

Professional Continuing Education

Academic and Professional Programs provides professional continuing education programs throughout the Phoenix metropolitan area. These ongoing programs are intended to improve professional competence and address current issues and trends, and are offered to adult learners in collaboration with ASU colleges, other educational providers, professional associations, and public and private organizations. In addition, the Elderhostel Program, a series of challenging, thought-provoking college-level courses, is offered to people over 55. For more information, call 480/965-9200.

The Nonprofit Management Institute is offered by the College of Extended Education and the Valley of the Sun United Way. This program is designed to enhance the management skills of those who serve nonprofit human services groups, hospitals, government agencies, churches, private schools, art organizations, environmental groups, and others in the nonprofit sector. For more information, see "Nonprofit Management Certificate Program," page 687, or call 480/965-9200.

For more information about Academic and Professional Programs, call 480/965-9797.

Global and Community Outreach

American English and Culture Program. The American English and Culture Program (AECPP) features an intensive course of study designed for adult international students who want to become proficient in English as a second lan-

guage for academic, professional, or personal reasons. Applicants must be at least 18 years of age and must have a high school diploma or its equivalent. All conditions of the U.S. Immigration and Naturalization laws pertaining to full-time study in the United States must be met by all applicants. Students are required to take an English placement test before the beginning of classes. Certificates of achievement are awarded on completion of the course. Admission to the program does not constitute regular admission to ASU.

Beginning, intermediate, and advanced courses provide instruction in listening, reading, speaking, structure, and writing. Academic advising and orientation to Arizona and the United States are integral parts of the program.

Program-wide social activities each cycle include a field trip, a picnic, a cultural activity, visits to museums, historical sites, or musical presentations. Campus housing and American Homestays are available.

Advanced-level students may be permitted to enroll concurrently in up to two ASU credit classes with the approval of the director. Several special classes are offered through the AIEP. Classes in conversation, speech improvement, and the Test of English as a Foreign Language are offered during alternate terms.

The fall and spring semesters are divided into two eight-week cycles. Students may enroll for one or more cycles. An eight-week summer session of study is also offered. Inquiries concerning admission requirements, enrollment, and fee schedules should be sent to

AMERICAN ENGLISH AND CULTURE PROGRAM
DEPARTMENT 4
ARIZONA STATE UNIVERSITY
PO BOX 873504
TEMPE AZ 85287-3504

For more information, call 480/965-2376.

Extended Campus Programs. Extended Campus Programs was established in response to the rapidly expanding demand for educational services in Maricopa County and throughout Arizona. Analyzing community needs for course offerings, workshops and seminars, the unit oversees the planning, organizing, and staffing necessary to satisfy these educational needs.

A primary goal of this unit is to ensure that qualified students have access to effective, appropriate university programs. Extended Campus Programs focuses on developing and maintaining education, business, government, professional, and community links to further the university's and college's missions.

The major components of Extended Campus Programs are the classes and events at the ASU Downtown Center and emerging programs in the east Valley, Scottsdale, and Ahwatukee. For more information, call 480/965-3046.

ASU Downtown Center. The ASU Downtown Center is a university-wide resource located in downtown Phoenix that serves as an educational, applied-research, and community-service facility.

Responding to the needs of business, industry, and state and local governments, the center offers traditional and interdisciplinary upper-division and graduate-level courses. The center also offers professional and continuing education

programs, lectures, and community forums, and serves as a meeting location for conferences, workshops and seminars.

ASU faculty, staff, and students may take advantage of the center's computer lab. A lab assistant is available during posted hours. Faculty, staff, and students also can access the ASU library online catalog and ASU library information and resources. Library books may be ordered and returned through the center. Textbooks for all courses held at the center are available at one of the ASU libraries usually at the beginning of each semester.

Accommodations for small or large meetings or conferences are available at attractive rates and can include beverages, food service, and professional equipment. Meeting rooms include conference rooms, a board room, and two computer classrooms. Most meeting rooms can be configured in a variety of styles and setups. In addition, break-out areas are conveniently located throughout the facilities. Advice in logistics planning is available as are a wide range of related services. The center is available for use by outside organizations, subject to the limits of university policies and procedures. Contact the center's facility scheduler for details.

For more information about the programs and services provided at the center, call 480/965-3046 or write

ASU DOWNTOWN CENTER
502 E MONROE ST
PHOENIX AZ 85004-2337

Several ASU programs and partnerships are located at the ASU Downtown Center.

Academic and Professional Programs. As part of ASU Extended Campus and the College of Extended Education, Academic and Professional Programs brings the resources of ASU to many who may not be pursuing a traditional degree but are seeking professional and personal enrichment. See "Academic and Professional Programs," page 687, for a description.

Joint Urban Design Program. The Joint Urban Design Program, located in the ASU Downtown Center, is a partnership between the Colleges of Architecture and Environmental Design and Extended Education. The program directs institutional and public resources toward developing an understanding of issues that affect the urban quality of Phoenix. For more information, call 480/727-5146.

Urban Data Center. The Urban Data Center, a partnership with the College of Public Programs, serves as a resource for analysis and implementation of public policy in the Phoenix metropolitan area. The center works closely with ASU researchers and organizations such as the Joint Urban Design Program, the Morrison Institute for Public Policy, University Libraries, local governments, state agencies, and other independent organizations to build a comprehensive database on policy issues for urban planners and community leaders. For more information, call 480/965-3046.

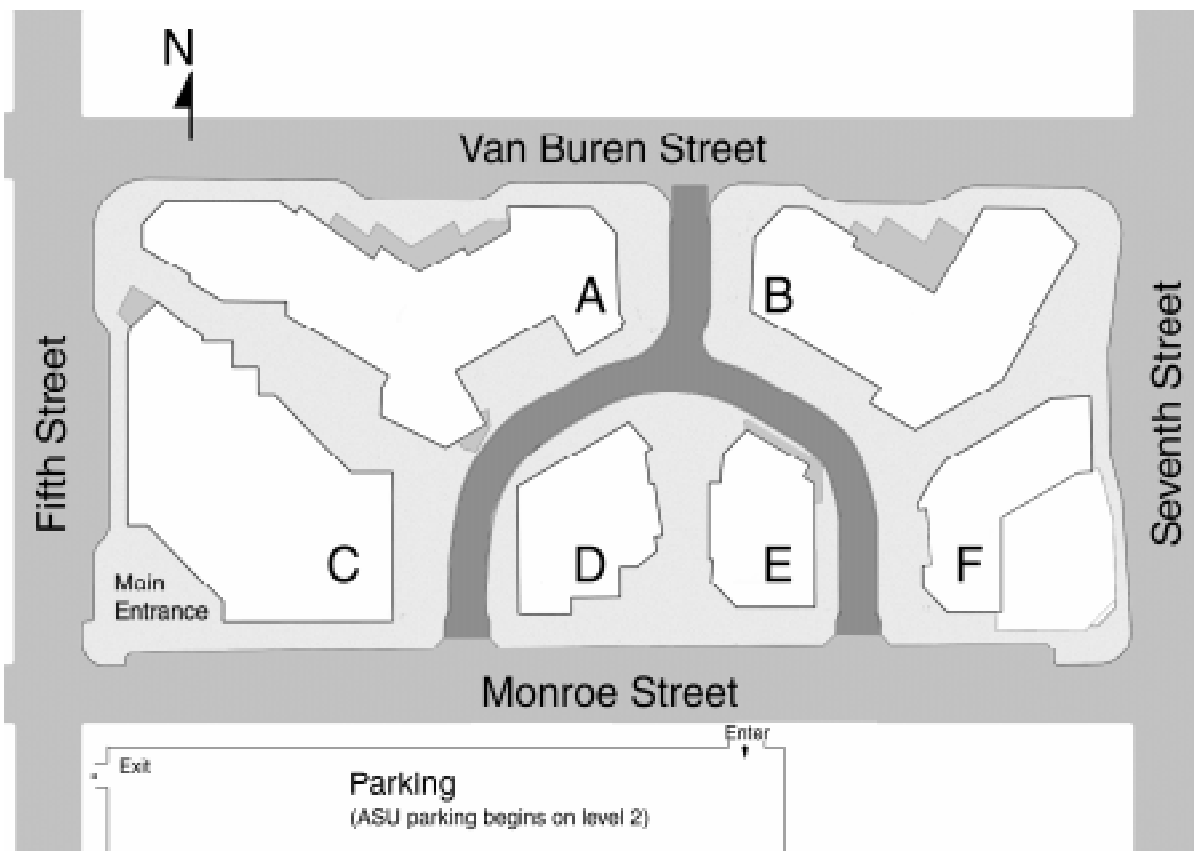
Advanced Public Executive Program. The Advanced Public Executive Program of the College of Public Programs is housed at the ASU Downtown Center. This program is designed to provide public managers and administrators with analytical approaches and skills through short courses and seminars to help mobilize ideas, people, and resources in support of public programs. For more information, call 480/965-4006.

Office of Youth Preparation and Project PRIME. The Office of Youth Preparation and Project PRIME (Project to Improve Minority Education) are housed at the Downtown Center with evaluation support services located at the Hispanic Research Center. The programs are designed to increase the pool of college-eligible minority students, who have historically been underrepresented in higher education, by providing instructional and support services to seventh-through 12th-grade students and their families at targeted Arizona schools. For more information, call 480/965-8510.

Arizona Drug and Gang Prevention Resource Center. The Arizona Drug and Gang Prevention Resource Center serves as a centralized source for individuals, schools, and communities throughout Arizona to support, enhance, and initiate prevention efforts.

For information about planning, mobilizing, training, and evaluating community prevention efforts, call the center at 480/727-2772.

ASU Downtown Center Map



ASU Extended Campus Administrative Personnel

Dean, College of Extended Education	Bette F. DeGraw
Associate Dean	William Verdini
Director, American English and Culture Program	Mark D. Rentz
Director, Communications and Marketing	Randy Bailey
Director, Development and Outreach	Scott Sheldon
Director, Distance Learning Technology	Elizabeth H. Craft
Director, Downtown Center	Bette F. DeGraw
Director, Extended Campus Programs	Jim Patzer
Director, Academic and Professional Programs	Patricia A. Feldman
Director, Operations and Finance	Cathie M. Fox

ASU Extended Campus Faculty and Academic Professionals

Backer, Linda R. (1997), Assistant Instructional Professional, College of Extended Education; Manager, Interdisciplinary Programs, Academic and Professional Programs, College of Extended Education; B.A., University of Colorado; M.S., Colorado State University

Craft, Elizabeth H. (1982), Senior Administrative Professional, College of Extended Education; Director, Distance Learning Technology, College of Extended Education; B.F.A., Ohio University; M.A., Arizona State University

DeGraw, Bette F. (1986), Administrative Professional, College of Extended Education; Associate Professor of Public Affairs; Dean, College of Extended Education; Director, Downtown Center, College of Extended Education; B.A., Thiel College; M.S.W., Rutgers, The State University of New Jersey; D.P.A., Arizona State University

Feldman, Patricia A. (1990), Associate Administrative Professional, College of Extended Education; Director, Academic and Professional Programs, College of Extended Education; B.S., M.Ed., Colorado State University

Kyselka, Christine K. (1990), Associate Administrative Professional, College of Extended Education; Assistant Director, Distance Learning Technology, College of Extended Education; B.S., M.P.A., Arizona State University

Pope, Donna (1999), Assistant Instructional Professional, College of Extended Education; Manager, Nonprofit Management Program, Academic and Professional Programs, College of Extended Education; B.S.W., Texas Women's University; M.S.S.W., University of Texas, Arlington

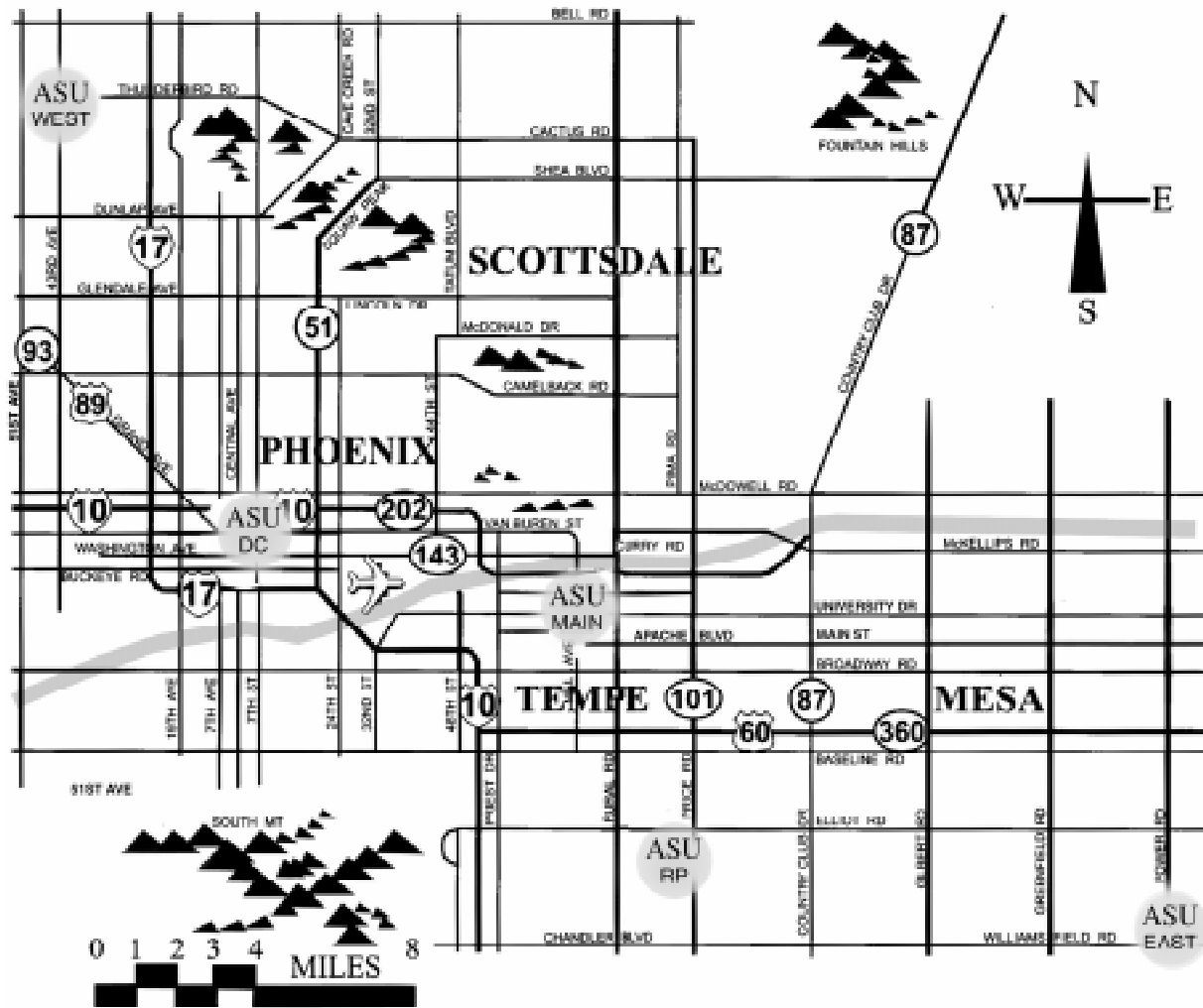
Verdini, William A. (1976), Associate Professor of Supply Chain Management; Associate Dean, College of Extended Education; B.S., Case Western Reserve University; M.B.A., D.B.A., Kent State University

ASU Extended Campus Directory

For the "ASU Main Directory," see page 522. For the "ASU East Directory," see page 662. For the "ASU West Directory," see page 674.

Organization	Location	Telephone	Web Address
Extended Education, College of	ASUDC C319	480/965-9696	www.asu.edu/xed
Academic and Professional Programs	RITT B132	480/965-9797	www.asu.edu/xed/profprog/profprog.html
	ASUDC	480/965-9200	—
American English and Culture Program	MARIP	480/965-2376	www.asu.edu/xed/aecp/aboutaecp.html
ASU Downtown Center	ASUDC	480/965-3046	www.asu.edu/xed/dtc
Communications and Marketing	ASUDC C319	480/965-9696	—
Development and Outreach	ASUDC C250	480/727-5330	—
Distance Learning Technology	RITT A 129	480/965-6738	www.dlt.asu.edu
Extended Campus Programs	ASUDC C250	480/965-3046	www.asu.edu/xed/degrees.html
Independent Learning	RITT B132	480/965-6563 or 1-800-533-4806	—
Operations and Finance	ASUDC C319	480/965-9696	—

ASU Vicinity Map



ASU MAIN ASU Main
Near Downtown Tempe

ASU DC ASU Downtown Center
Monroe and Fifth Streets,
Phoenix

ASU EAST ASU East
Power and Williams Field Roads,
Mesa

ASU RP ASU Research Park
Price and Elliot Roads,
Tempe

ASU WEST ASU West
43rd Avenue and
Thunderbird Road

 Phoenix Sky Harbor
International Airport

Accreditation and Affiliation

ASU Main and ASU East. Arizona State University Main is accredited by the North Central Association (NCA) Commission on Institutions of Higher Education. Arizona State University East is recognized by the NCA as a full-service campus and is accredited under the ASU Main umbrella. Programs in the various colleges, schools, divisions, and departments are accredited by, affiliated with, or members of national bodies as described in the “Academic Accreditation at ASU Main and East” table, on this page; “Academic Affiliation” table, page 694; and “Academic Membership” table, page 695. Some programs in the College of Education are approved by the State Board of Education (Arizona) and the National Association of School Psychologists.

ASU West. ASU West is separately accredited by the NCA Commission on Institutions of Higher Education. Professional programs in the various academic areas are accredited by national bodies as described in the “Academic Accreditation at ASU West” table, page 694.

Academic Accreditation at ASU Main and East

Unit or Program	Accredited By
College of Architecture and Environmental Design	
B.S.D., Interior Design	Foundation for Interior Design Education Research
B.S.L.A.	Landscape Architectural Accreditation Board
M.Arch.	National Architectural Accrediting Board
M.E.P.	Planning Accreditation Board
College of Business	
All programs	AACSB—International Association for Management Education
School of Accountancy and Information Management	AACSB—International Association for Management Education
M.H.S.A. School of Health Administration and Policy	Accrediting Commission on Education for Health Services Administration
College of Education	
M.C., Counseling	Council for Accreditation of Counseling and Related Educational Programs
Ph.D., Counseling Psychology; Educational Psychology with a concentration in school psychology	American Psychological Association
College of Engineering and Applied Sciences	
B.S., Computer Science	Computer Science Accreditation Commission of the Computing Sciences Accreditation Board
B.S., Construction	American Council for Construction Education
B.S.E., Aerospace Engineering; Bioengineering; Chemical Engineering; Civil Engineering; Computer Systems Engineering; Electrical Engineering; Industrial Engineering; Materials Science and Engineering; Mechanical Engineering	Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.
College of Law	
J.D.	American Bar Association
College of Liberal Arts and Sciences	
B.S., Clinical Laboratory Sciences	National Accrediting Agency for Clinical Laboratory Sciences
M.S., Communication Disorders	American Speech-Language-Hearing Association
Ph.D., Psychology with a concentration in clinical psychology	American Psychological Association
College of Nursing	
B.S.N., M.S., Nursing	Arizona State Board of Nursing Commission on Collegiate Nursing Education National League for Nursing
College of Public Programs	
B.S., Recreation	Council on Accreditation of the National Recreation and Park Association

* This program is accredited through the ASU Main College of Business.

Academic Accreditation at ASU Main and East (continued)

Unit or Program	Accredited By
College of Public Programs (continued) B.S.W., M.S.W., School of Social Work M.P.A. Walter Cronkite School of Journalism and Telecommunication	Council on Social Work Education National Association of Schools of Public Affairs and Administration Accrediting Council on Education in Journalism and Mass Communications
College of Technology and Applied Sciences B.S., Aeronautical Engineering Technology; Electronics Engineering Technology; Manufacturing Engineering Technology B.S., Aeronautical Management Technology, with concentrations in airway science flight management and airway science management	Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. Council on Aviation Accreditation
East College B.S., Business Administration* B.S., Nutrition (didactic program in dietetics); M.S., Nutrition (dietetic internship)	AACSB—International Association for Management Education American Dietetic Association
Herberger College of Fine Arts Department of Theatre School of Music	National Association of Schools of Theatre National Association of Schools of Music

* This program is accredited through the ASU Main College of Business.

Academic Accreditation at ASU West

Unit or Program	Accredited By
College of Human Services Department of Recreation and Tourism Management Department of Social Work	National Recreation and Park Association/American Association for Leisure and Recreation Council on Social Work Education
School of Management All programs	AACSB—International Association for Management Education

Academic Affiliation

Unit or Program	Affiliated With
Barrett Honors College	National Collegiate Honors Council
College of Architecture and Environmental Design School of Architecture	American Institute of Architects, Central Arizona and Rio Salado Chapters Architectural Research Centers Consortium Association for Computer-Aided Design in Architecture Association of Collegiate Schools of Architecture
School of Design	American Society of Interior Designers Human Factors and Ergonomics Society Industrial Designers Society of America Interior Design Educators Council International Interior Design Association Society of Environmental Graphic Designers
School of Planning and Landscape Architecture	American Planning Association American Society of Landscape Architects Association of Collegiate Schools of Planning Council of Educators in Landscape Architecture
College of Education	American Association of Colleges for Teacher Education American Educational Research Association University Council for Educational Administration

Academic Affiliation (continued)

Unit or Program	Affiliated With
College of Nursing Continuing Extended Education Program	Arizona Nurses Association (American Nurses Credentialing Center's Commission on Accreditation)
Morrison School of Agribusiness and Resource Management B.S., M.S., Environmental Resources	Society for Range Management Soil and Water Conservation Society Wildlife Society

Academic Membership

Unit or Program	Membership With
Barrett Honors College	National Collegiate Honors Council
College of Education	American Association of Colleges for Teacher Education Association of Colleges and Schools of Education in State Universities and Land Grant Colleges University Council for Educational Administration
College of Law	Association of American Law Schools
College of Liberal Arts and Sciences	
Department of Anthropology	American Anthropological Association Council for Museum Anthropology
Department of Biology	American Institute of Biological Sciences American Society of Naturalists American Society of Zoologists Animal Behaviorists' Society Sigma Psi
Department of Chemistry and Biochemistry	American Association for the Advancement of Science American Chemical Society American Society for Advancement of Science
Department of Exercise Science and Physical Education	American Academy of Kinesiology and Physical Education American Alliance for Health, Physical Education, Recreation and Dance American College of Sports Medicine American Society of Biomechanics Committee on Allied Health Education Council on Physical Education for Children International Society of Biomechanics National Association for Physical Education in Higher Education North American Society for Sports Psychology and Physical Activity Physiological Society Society for Experimental Biology Society for Neuroscience
Department of Geography	Association of American Geographers
Department of Geological Sciences	American Association of Petroleum Geologists American Geophysical Union American Institute of Professional Geologists Geological Society of America Mineralogical Society of America Society of Economic Paleontologists and Mineralogists
Department of History	American Association for State and Local History American Association of Museums American Historical Association Coordinating Committee for History in Arizona Institute of Historical Research National Council on Public History Western History Association

Academic Membership (continued)

Unit or Program	Membership With
Department of Languages and Literatures	American Council on Teaching Foreign Language International Studies Association Modern Language Association
Department of Mathematics	American Mathematical Society Mathematical Association of America Rocky Mountain Mathematics Consortium Society for Industrial and Applied Mathematics
Department of Microbiology	American Association of Immunologists American Association of Immunology American Society for Virology American Society of Microbiology Society for Neuroscience
Department of Military Science M.S., Ph.D., Molecular and Cellular Biology	Association of U.S. Army American Society of Medical Technology
Department of Philosophy	American Philosophical Association
Department of Physics and Astronomy	Acoustical Society of America American Association of Physicists in Medicine American Association of Physics Teachers American Astronomical Society American Crystallographic Association American Physical Society American Vacuum Society International Astronomical Union Materials Research Society Optical Society of America
Department of Plant Biology	American Chemical Society American Institute of Biological Sciences American Society for Biochemistry and Molecular Biology American Society of Cell Biology American Society of Horticultural Science American Society for Photobiology American Society of Plant Physiologists American Society of Plant Taxonomy Arizona-Nevada Academy of Science Botanical Society of America Botanical Society of Japan California Botanical Society Ecological Society of America International Association of Landscape Ecology International Association of Plant Taxonomy International Association for Study of Plant Succulents International Association of Wood Anatomists International Organization of Paleobotany International Photosynthesis Society International Phycological Society International Society of Arboriculture International Society of Ecological Modeling International Society of Plant Molecular Biology International Society of Plant Propagators International Union of Woody Plant Physiologists Microscopy Society of America Mycological Society of America Phycological Society of America Phytochemical Society of North America Sigma Xi Society of Ecological Restoration Society of Wetlands Scientists Society for Economic Botany

Academic Membership (continued)

Unit or Program	Membership With
Department of Plant Biology (continued)	Soil Science Society of America Southwestern Association of Naturalists
Department of Political Science	American Political Science Association Inter-University Consortium for Political and Social Research
Department of Psychology	American Society of Clinical Psychologists
Department of Sociology	American Sociological Association
Women's Studies Program	Association for Women in Science National Women's Studies Association
College of Nursing	American Association of Colleges of Nursing Western Institute of Nursing
College of Public Programs	
Department of Recreation Management and Tourism	American Humanics, Inc. Arizona American Indian Tourism Association Arizona Heritage Alliance Arizona Park and Recreation Association Arizona State Therapeutic Recreation Association Association for Research on Nonprofit and Voluntary Action Association for Volunteer Administration College Fund/UNCF Learning Institute National Center for Nonprofit Boards National Park and Recreation Association National Society of Fund Raising Executives National Training Institute for Community Youth Work Nonprofit Risk Management Center Peter F. Drucker Foundation for Nonprofit Management Society for Nonprofit Organizations Travel Tourism Research Association
Hugh Downs School of Human Communication	National Communication Association Western States Communication Association
School of Justice Studies	Arizona Justice Educators Association of Criminal Justice Doctoral Programs National Academic Advising Onati International Institute for the Sociology of Law National Association of Schools of Public Affairs and Administration
School of Public Affairs	Baccalaureate Program Directors Association
School of Social Work	Council on Social Work Education Group for the Advancement of Doctoral Education National Association of Deans and Directors of Social Work National Association of Social Workers
Walter Cronkite School of Journalism and Telecommunication	Association of Schools of Journalism and Mass Communication Broadcast Education Association
East College	
Department of Nutrition	American Dietetic Association
Graduate College	Council of Graduate Schools
Herberger College of Fine Arts	
Department of Theatre	American Alliance for Theatre and Education Association for Theatre in Higher Education
Morrison School of Agribusiness and Resource Management	
B.S., Agribusiness with a concentration in professional golf management	Professional Golfer's Association of America

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Building Abbreviations

ADM (Wings A–B) Administration
 AED College of Architecture and Environmental Design/North
 AG Agriculture Building
 AGB1–4 ASU East Agribusiness Quads 1–4¹
 AGBFS ASU East Agribusiness Food Science Lab¹
 AIP ASU East American Indian Programs¹
 ALTCH ASU East Altitude Chamber¹
 ANTH Anthropology Building
 ANX Visual Arts Annex
 AQUAT (Wings A and B) Mona Plummer Aquatics Center
 ARCH College of Architecture and Environmental Design/South
 ARCV University Archives
 ART Art Building
 ARWH Art Warehouse
 ASUDC Downtown Center
 BA Business Administration Building
 BAC Business Administration C-Wing
 BKSTR ASU Bookstore
 CERA (Wings A and B) Ceramics Annex
 CFS Center for Family Studies
 CHAPL Danforth Chapel
 CLCC Classroom Laboratory/Computer Classroom Building²
 CLRB ASU East Classroom Building¹
 CMPIN Campus Inn
 CNTR ASU East Academic Center Building¹
 COMM2 ASU East Communications Building¹
 COWDN Cowden Family Resources Building
 CP Central Plant
 PCOM Computing Commons Building
 CRI Cancer Research Institute
 CRNX Classroom Annex²
 CSB Community Services Building
 CSC Central Services Complex²
 DPSMN Department of Public Safety—Main
 EAW ASU East Exercise and Wellness¹
 EAW2 ASU East Exercise and Wellness Annex¹
 ECA Engineering Center A-Wing
 ECB Engineering Center B-Wing
 ECC Engineering Center C-Wing
 ECD Engineering Center D-Wing
 ECE Engineering Center E-Wing
 ECF Engineering Center F-Wing
 ECG Engineering Center G-Wing
 ECANX Engineering Center Annex
 ED Hiram B. Farmer Education Building
 EDB Ira D. Payne Education Hall
 EDC Education Lecture Hall
 ELAB Electronics Laboratory Building²
 ENGR Engineering Research Center
 FAB Faculty and Administration Building²
 FABNX Faculty and Administration Building Annex²
 FAC Nelson Fine Arts Center
 FIELD University Field Lab
 FLHLB Fletcher Library²
 GGMA Grady Gammage Memorial Auditorium
 GHALL Dixie Gammage Hall
 GWC Barry M. Goldwater Center for Science
 and Engineering Research
 HSC ASU East Health Sciences Center¹
 HSC2 ASU East Health Sciences Center Annex¹
 IAPNX Interdisciplinary Arts and Performance Annex²
 ICA Intercollegiate Athletics
 IRISH (A–C) Frederick M. Irish Hall
 LAW John S. Armstrong Hall
 LAWLB John J. Ross-William C. Blakley Law Library
 LIB Charles T. Hayden Library

LL G. Homer Durham Language and Literature Building
 LSA Life Sciences A-Wing
 LSC Life Sciences C-Wing
 LSE Life Sciences E-Wing
 LYC Lyceum Theatre
 MAIN Old Main
 MANZH Manzanita Hall
 MARIP Mariposa Hall
 MCENT A.J. Matthews Center
 MCL James H. McClintock Hall
 MB M.O. Best Hall
 MHALL Carrie Matthews Hall
 MOEUR B.B. Moeur Administration
 MTCHL Mitchell School (Tempe)
 MU Memorial Union
 MUR John Murdock Lecture Hall
 MUSIC (Wings E and W) Music Building
 NEEB L.S. Neeb Hall
 NOBLE Daniel E. Noble Science and Engineering Library
 NUR Nursing Building
 PBS Packard Baseball Stadium
 PEBE Physical Education Building East
 PEBW Physical Education Building West
 PGM ASU East Professional Golf Management¹
 PPS Physical Plant Shops
 PRNT ASU East IMT Print Facility¹
 PS (Wings A–G) George M. Bateman Physical Sciences Center
 PSH Physical Science H-Wing
 PSY Psychology Building
 PVE Palo Verde East
 PVM Palo Verde Main
 PVW Palo Verde West
 RITT (Wings A and B) Ritter Building
 SANDS Sands Classroom Building²
 SCOB John W. Schwada Classroom Office Building
 SCRED Sonora Center Residence Education Center
 SDF Solar Demonstration Facility
 SHS (Wings A and B) Student Health Service
 SIM ASU East Flight Simulator Building¹
 SOLAR ASU East Photovoltaics Testing Laboratory¹
 SRC Student Recreation Complex
 SS Social Sciences Building
 SSV Student Services Building
 STAD Sun Devil Stadium
 STAU (Wings A and B) Charles Stauffer Communication
 Arts Building
 TC Technology Center
 TCB Aeronautics Building
 TCC Technology Center Annex
 TECH ASU East Technology Center¹
 TECH2 ASU East Technology Center Annex¹
 THWH Theatre Warehouse
 TOWER (Wings A and B) University Tower Center
 TRACK Joe Selleh Track
 UASB Undergraduate Academic Services Building
 UCB University Center Building²
 UCLUB University Club
 UNION ASU East Williams Campus Union Building¹
 UVCMN University Commons
 VISIT ASU Visitor’s Information Center
 WFA Wells Fargo Arena
 WFLD ASU West Alternate Locations²
 WH Warehouse
 WHALL West Hall
 WILSN George W. Wilson Hall
 WTC Whiteman Tennis Center

¹ Located at ASU East.
² Located at ASU West.