
Humanities

Interdisciplinary Master's Program

www.asu.edu/clas/humanities

480/965-6747

LL 641

Nancy Gutierrez, Interim Director

Humanities

Professors: Kugelmass, Lehman

Associate Professors: Privateer, Wright

Assistant Professors: Baker, Duncan, Lund, Romeyn, Taylor

Languages and Literatures

Regents' Professor: Foster

The Graduate Committee on Humanities offers an interdisciplinary program leading to the M.A. degree in Humanities. One of the unique features of this interdisciplinary program is that, because it uses faculty research/teaching interests from a number of disciplines, a student may tailor a course of study to fit individual needs and goals. The committee is chaired by Humanities core faculty and may include members from several departments. At the same time, the individualized program is balanced by a required core of several courses emphasizing interdisciplinary methodology and theory. Faculty and courses are not limited, however, to the departments and schools listed, since it is understood that many fields may be approached from a humanistic perspective.

MASTER OF ARTS

Among the small number of humanities M.A. programs in the U.S., the ASU program stands out in terms of its substance and breadth. The core of the curriculum, a sequence of three required courses, provides students with an introduction to an extremely wide range of classical and contemporary cultural theory. At the same time, the large number of elective classes at their disposal permits students to fashion a specialized field for themselves, typically combining work in two or more of the traditional humanities disciplines. The thesis—the capstone of the requirements for the degree—gives students the opportunity to make an original and substantial contribution to scholarship in their chosen field. This combination—a solid grounding in cultural theory, interdisciplinary specialization, and advanced research and writing—makes this M.A. program unique among its peers.

Admission. Students who fulfill the general requirements of the Graduate College and who have a B.A. in any of the humanities disciplines listed by the National Endowment for the Humanities are invited to apply. This invitation, however, does not preclude students who have bachelor's degrees in the social and natural sciences. In addition to meeting Graduate College requirements, students must sub-

mit Graduate Record Examination scores; three letters of academic recommendation; and a brief letter of intent, outlining their academic career to date and plans for the future, at ASU and beyond. Prospective students should apply by March 1 for admission into the program the following fall. Students whose applications are complete by the March 1 deadline will be notified of their admission status by April 15. Qualified students applying after March 1 will be admitted depending on the availability of space.

Program of Study. M.A. students must complete a minimum of 30 hours of course work, including six hours of thesis preparation. In most cases, this involves a two-year program of study, focused on the following requirements:

Core Courses. Students take a sequence of three core courses, one in each of their first three semesters. Contact an advisor for details.

Area of Study. Beyond the core courses, students use their remaining electives to develop a specific area of study, whose ultimate expression is the thesis, but which is also grounded in course work. The areas of study sponsored by the faculty include, but are not limited to: American studies; art and society; classical studies; comparative literatures and cultures; film and media studies; gender and sexuality; intellectual history and philosophy; Jewish studies; performance studies; post-colonial studies; science, technology, and culture.

Foreign Language Exam. M.A. students are required to pass a foreign language reading examination during the first three semesters.

Master's Thesis. The centerpiece of the master's degree is a written thesis that makes an original and substantial contribution to scholarship in the humanities. Most students are expected to work toward a thesis proposal and the formation of a thesis committee (consisting of a chair drawn from the Humanities faculty and two other members) during their first two semesters; to finalize their committee and receive its approval of their proposal in their third semester; and to complete the thesis in the fourth semester. A final oral defense of the thesis is required.

Faculty Research Interests. Social and intellectual history; the Enlightenment; media studies; cultural studies; Latin America; queer theory; gender studies; subaltern studies; ideological approaches to literature; comparative literature; postcolonial studies; classical culture; East European and American Jews; Israel; urban studies; humor; technology and culture; intercultural perceptions; European imperialism and colonialism; American studies; science and the humanities; Southeast Asian art history; critical theory; cultural anthropology; culture and organizational theory.

HUMANITIES (HUM)

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.

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.

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.

HUM 460 Postmodern Culture and Interpretation. (3)*selected semesters*

Currents and interpretations of postmodern culture; international, comparative perspective on the culture and traditions of contemporary "Europes" and "Americas." Seminar, discussion.

HUM 462 Psychoanalysis and Culture. (3)*fall*

Introduces intellectual history of psychoanalytic movement of the 20th century and its contribution to humanities disciplines.

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.

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 502 Writing Cultures. (3)*spring*

Theories and methods of representing Western and non-Western cultures in literature, history, ethnography, and pictorial media.

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 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. Fee.

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*

Topics may include the following:

- Cultural Productions. (3)
- Theory and Culture. (3)
- Tragedy: Meaning and Form. (3)

HUM 598 Special Topics in the Humanities. (1–4)*selected semesters*

Open to all students. Topics may include the following:

- Comparative Fine and Performing Arts. (3)
- Cultures of Ethnic Minorities. (3)
- Film and Media Studies. (3)
- Film Theory and Criticism
Fee.
- Non-Western Cultures. (3)
- Sexuality in the Media
Fee.
- Western Historical or Contemporary Cultures. (3)

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

Indian Law**Certificate Program**

See "Indian Legal Program," page 72.

Industrial Engineering**Master's and Doctoral Programs**

ceaspub.eas.asu.edu/ie

480/965-3185

GWC 502

Gary L. Hogg, Chair

Professors: Cochran, Dooley, Henderson, Hogg, Hubele, Montgomery, Runger, Wolfe

Associate Professors: Anderson-Rowland, Fowler, Mackulak, Moor, Mou, Roberts, Shunk, Villalobos, Ye

Assistant Professors: Carlyle, Gel, Kulahci, Wu

Lecturer: Borrer

The faculty in the Department of Industrial Engineering offer graduate programs leading to the M.S., the Master of Science in Engineering, and the Ph.D. degrees in Industrial Engineering.

The overall educational objective of graduate study in industrial engineering is to improve each student's ability to understand, analyze, and resolve problems within complex organizations. Industrial engineers must develop qualitative and quantitative abilities to assist management in such diverse organizations as banks, government, hospitals, military, and manufacturing operations.

It is required that all students applying for one of the master's or doctoral degree programs submit scores (verbal, quantitative, analytical) on the Graduate Record Examination, a statement of purpose, and three letters of recommendation.

Applicants may have a baccalaureate degree in a major field other than industrial engineering, although engineering, mathematics, or science is recommended. The student's qualifications are reviewed by the faculty.

MASTER OF SCIENCE

The Master of Science (M.S.) degree is a research degree requiring a thesis and an oral defense. See "Master's Degrees," page 93, for general requirements.

GRADUATE PROGRAMS AND COURSES

MASTER OF SCIENCE IN ENGINEERING

The Master of Science in Engineering (M.S.E.) degree is a non-research degree requiring additional course work and a written comprehensive examination. See “Master of Science in Engineering,” page 196, for more information on the Master of Science in Engineering degree.

The faculty also participate in offering the tri-university Master of Engineering Program. For more information, see “Master of Engineering,” page 190.

DOCTOR OF PHILOSOPHY

The Ph.D. degree in Industrial Engineering is conferred upon evidence of excellence in research that culminates in a dissertation representing a significant contribution to the field of industrial engineering.

See “Doctor of Philosophy,” page 96, for general requirements.

Program of Study. The program of study should be developed early in the second semester of Ph.D. study or when the student has completed nine semester hours of courses at ASU. Specific requirements may be obtained from the department.

Early Evaluation. In the second regular semester in residence, the student’s program of study and academic accomplishment to date serve as a basis for evaluation by the supervisory committee. The results of this evaluation are used to assist the student in improving or modifying the program of study, to encourage the continuance of Ph.D. studies or, if necessary, to discourage the student from continuing in the program.

Foreign Language Requirements. None.

Comprehensive Examinations. When the Ph.D. student has essentially completed the course work in the approved program of study and submitted a research proposal to the advisory committee, the student is given a written comprehensive examination relating to the research area. The written examination is followed by an oral exam. Upon successful completion of the comprehensive examinations, the student is admitted to candidacy.

Dissertation Requirements. A dissertation based on original work demonstrating creativity in research and scholarly proficiency in the subject area is required.

Final Examination. A final oral examination in defense of the dissertation is required.

RESEARCH ACTIVITY

For up-to-date information about research activity, access the Department of Industrial Engineering Web site at ceaspub.eas.asu.edu/ie.

INDUSTRIAL ENGINEERING (IEE)

IEE 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. Credit is allowed for only IEE 485 or 500. Prerequisite: ECE 380.

IEE 505 Information Systems Engineering. (3)

fall and spring

Studies information systems application engineering. Topics include information technology, data modeling, data organization, process mapping, application and database engineering, and user interface development. Prerequisites: CSE 200; 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. Prerequisites: ECE 380; graduate standing.

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 or graduate standing.

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: graduate standing.

IEE 532 Management of Technology. (3)

fall

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 or 541.

IEE 533 Scheduling and Network Analysis Models. (3)

spring

Applies scheduling and sequencing algorithms, deterministic and stochastic network analysis, and flow algorithms. Prerequisites: ECE 380; IEE 476 (or 546).

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: graduate standing.

IEE 545 Simulating Stochastic Systems. (3)

fall and spring

Analyzes 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: CSE 200; IEE 476 (or 546). Pre- or corequisite: IEE 485 or 500.

IEE 546 Operations Research Techniques/Applications. (4)

fall and spring

Models and analyzes 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. Prerequisites: ECE 380; graduate standing.

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

Studies concepts of strategy, strategy formulation process, and strategic planning methodologies with emphasis on engineering design and manufacturing strategy, complemented with case studies. Presents and uses an analytical executive planning decision support system throughout course. Prerequisite: graduate standing. Pre- or corequisites: IEE 545, 561, 572, 574.

IEE 560 Object-Oriented Information Systems. (3)

spring

Applies object-oriented technology and concepts to enterprise information systems. Topics include requirement analysis, object-oriented design and programming, rapid application development, object data management, and development of object-oriented distributed applications. 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: IEE 476, 485.

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 Distributed Information Systems. (3)

fall and spring

Introduces concepts and technologies that form the core of distributed enterprise information systems. Topics include client-server architectures, distributed objects and paradigms, internet, World Wide Web, distributed information sharing, network programming, and e-commerce and enterprise applications. Prerequisite: IEE 505.

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

Uses simulation in computer-integrated manufacturing with an emphasis on modeling material handling systems. Programming, declarative, and intelligence-based simulation environments. Prerequisite: IEE 475 or 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 475 or 545.

IEE 569 Advanced Statistical Methods. (3)

fall in even years

Applies statistical modelling and inference techniques to problems in engineering and science. Topics may include multivariate methods, spatial modeling, and nonparametric methods. Prerequisite: IEE 485 or 500.

IEE 570 Advanced Quality Control. (3)

spring

Process monitoring with control charts (Shewhart, cusum, EWMA), feedback adjustment and engineering process control, process capability, autocorrelation, selected topics from current literature. Prerequisite: IEE 485 or 500.

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 strategy of experimentation, factorials, blocking and confounding, fractional factorials, response surfaces, nested and split-plot designs. Prerequisite: ECE 380.

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 or 546.

IEE 575 Applied Stochastic Operations Research Models. (3)

spring

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: IEE 476 (or 546), 485 (or 500).

IEE 576 Modeling and Analysis of Semiconductor Manufacturing Operations. (3)

fall

Applies operations research and statistical methods to solve problems that involve semiconductor manufacturing operations. Prerequisites: IEE 485 (or 500), 476 (or 546).

IEE 578 Regression Analysis. (3)

fall

Regression model building oriented toward engineers and physical scientists. Topics include linear regression, diagnostics, biased and robust fitting, nonlinear regression. Prerequisite: IEE 485 or 500.

IEE 579 Time Series Analysis and Forecasting. (3)

fall in odd years

Forecasting time series by regression-based, exponential smoothing, and ARIMA model techniques; uses digital computer programs to augment the theory. Prerequisite: IEE 485 or 500.

IEE 582 Response Surfaces and Process Optimization. (3)

spring

Classical response surface analysis and designs including steepest ascent, canonical analysis, and multiple responses. Other topics include process robustness studies, robust design, and mixture experiments. Prerequisite: IEE 572.

IEE 593 Applied Project. (1–12)

selected semesters

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)

selected semesters

Topics may include the following:

- Advanced Topics in Deterministic Operations Research. (3)
- Advanced Topics in Scheduling. (3)
- Analysis of Massive Data Sets. (3)
- Computer and Human Vision. (3)
- DOE/SPC for Semiconductor Processes. (3)
- Enterprise Internet/Intranet. (3)
- Introduction to Rapid Prototyping. (3)
- Mechatronics. (3)

GRADUATE PROGRAMS AND COURSES

- Product Modeling. (3)
- Strategic Design of Manufacturing Systems. (3)
- Strategic Issues in Manufacturing. (3)

IEE 599 Thesis. (1–12)

selected semesters

IEE 672 Advanced Topics in Experimental Design. (3)

spring in even years

Multilevel and mixed-level factorials and fractions, design optimality, incomplete blocks, unbalanced designs, random effects and variance components, analysis of covariance. Prerequisite: IEE 572.

IEE 677 Regression and Generalized Linear Models. (3)

spring in odd years

Theory of linear models including least squares, maximum likelihood, likelihood-based inference. Generalized linear models including Poisson and logistic regression, generalized estimating equations. 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.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

Information Management

Master's Program

www.cob.asu.edu/acct

480/965-3631

BA 223

Philip M.J. Reckers, Director

Professors: J.R. Boatsman, Boyd, Christian, Goul, Johnson, Kaplan, Pany, Pei, Philippakis, Reckers, Roy, Schultz, Smith, St. Louis, Steinbart, Vinze, Wyndelts

Associate Professors: David, Golen, Gupta, Hwang, Iyer, Keim, Kulkarni, Moeckel, O'Dell, O'Leary, Regier, Whitecotton, Yen

Assistant Professors: Bhattacharya, Chen, Chenoweth, Comprix, Dowling, Lee, O'Donnell, Petersen, Ravindran, Robinson, Roussinov, Rowe, Santanam, Shao, Weiss

Senior Lecturers: Goldman, Maccracken, Shrednick

Lecturers: J.L. Boatsman, Geiger, Hayes

The faculty in the School of Accountancy and Information Management, College of Business, offer specialized professional programs leading to the Master of Science in Information Management, Master of Accountancy and Information Systems (see "Accountancy and Information Systems," page 98), and Master of Taxation (see "Taxation," page 328) degrees.

The faculty also participate in the programs leading to the Master of Business Administration (see "Master of Business Administration," page 131) and Ph.D. degree in Business Administration (see "Doctor of Philosophy," page 132) degrees.

For more information, visit the school's Web site at www.cob.asu.edu/acct.

MASTER OF SCIENCE

The program leading to the M.S. degree in Information Management educates specialists to develop and apply quantitative and computer methods to support business decision making. The program prepares students for careers in professional accounting, accounting and computer information systems/management, business consulting and corporate accounting/finance.

Admission. All applicants are required to submit the supplemental application materials required from the school. Complete application instructions may be obtained from the school's Web site at www.cob.asu.edu/acct.

Applicants must also submit scores from the Graduate Management Admission Test (GMAT). International applicants whose native language is not English must submit scores from the Test of English as a Foreign Language (TOEFL) and Test of Spoken English (TSE) exams. Preference in admission is given to those with degrees in accounting and business, although other exceptional candidates are considered.

Prerequisites. Applicants must complete the program prerequisites. Refer to the School of Accountancy and Information Management Web site for a current listing of required course prerequisites for the program.

Program of Study. The program of study consists of a minimum of 30 semester hours and is continually updated. A sample program of study might include:

ACC 533	Application Solutions in the Connected Economy	3
ACC 541	Strategic Innovations in Information and Cost Management.....	3
ACC 591	S: Electronic Commerce	3
CIS 505	Object-Oriented Modeling and Programming	3
CIS 506	Business Database Systems	3
CIS 512	Intelligent Decision Systems and Knowledge Management.....	3
CIS 530	Information Systems Development.....	3
CIS 535	Distributed Information Systems	3
CIS 593	Applied Project	3

Course Load. Students are limited to 12 hours per trimester.

Foreign Language Requirements. None.

Thesis Requirements. An applied project is required.

Final Examinations. A final written examination is required of all candidates and is integrated with the applied project.

RESEARCH ACTIVITY

For current information about research activity, access the School of Accountancy and Information Systems Web site at www.cob.asu.edu/acct.

COURSES

For courses, see "Accountancy (ACC)," page 99, and "Computer Information Systems (CIS)," page 99.

Interdisciplinary Studies

ASU West offers a Master of Arts degree in Interdisciplinary Studies. For information, see the *ASU West Catalog*, call 602/543-4567, or access www.west.asu.edu on the Web.

Justice Studies

Master's Program

www.asu.edu/copp/justice

480/965-7682

WILSN 327

Doris Marie Provine, Director

Regents' Professor: Altheide

Professors: Cavender, Figueira-McDonough, Haynes, Hepburn, Johnson, Jurik, Lauderdale, Musheno, Provine, Romero, Schneider, Zatz

Associate Professors: Bortner, Lujan, Menjivar, Riding In

Assistant Professors: Adelman, Afflitto, Hanson, Lopez

The faculty in the School of Justice Studies offer a program leading to the M.S. degree in Justice Studies.

Information about the interdisciplinary Ph.D. degree in Justice Studies may be obtained from the graduate coordinator's office. See "Justice Studies," page 243.

MASTER OF SCIENCE

The faculty in the School of Justice Studies offer a program leading to the M.S. degree in Justice Studies. The study of justice is an interdisciplinary field of scholarship, research, and teaching, embracing those aspects of social and behavioral sciences relevant to an understanding of law, justice, crime, and social deviance. It includes a critical examination of the policies and organizational processes that have evolved for handling attendant problems. The M.S. degree has been designed to prepare students for professional positions in justice-related agencies, for teaching

in community colleges, and for further study and research in the justice field.

Admission. In addition to meeting Graduate College requirements, the applicant must submit Graduate Record Examination (GRE) scores, a one- or two-page statement outlining the applicant's educational and career goals related to Justice Studies, areas of interest, and three letters of recommendation, preferably from academic referees. Because of enrollment limits, candidates who meet minimum requirements are not automatically admitted into the program.

Selection Criteria. In selecting promising candidates, the admissions committee evaluates past academic performance, scores from the GRE, and potential for success as indicated by recommendations and personal statements.

Applications to the program may be made at any time; however, complete files must be submitted to the Graduate College by January 1 for fall admission.

International Applicants. In addition to admission material, international applicants whose native language is not English must submit scores from the Test of English as a Foreign Language. Evidence that sufficient funds are available for financing the student's academic program also must be submitted. See "Admission to the Graduate College," page 84, for more information.

Advisory Committee. Upon admission of the applicant, a temporary advisor is appointed. The temporary advisor is a faculty member who assists students in the selection of courses for the first semester until an advisory committee is formed. Typically, by the end of the first year, students form an advisory committee consisting of a chair and two members. The chair and at least one member must be faculty of the School of Justice Studies.

The committee members must be appointed by the dean of the Graduate College upon the recommendation of the director of the School of Justice Studies. The advisory committee works with the student to establish a program of study, to direct the thesis or applied project, and to administer the oral examination.

Program of Study. The M.S. degree in Justice Studies has two options: a thesis or an applied project. The thesis option requires the completion of 36 semester hours, of which six are thesis hours. The applied project option requires the completion of 42 semester hours, of which three are JUS 593 Applied Project. Each student's program is developed in concert with the advisory committee. The program of study has three major categories: foundation courses, elective courses, and thesis or applied project requirements.

Foundation Courses. The required foundation courses provide students with a fundamental understanding of the theories, methods, and analytic techniques associated with the study of justice. Foundation courses include:

JUS 500	Justice Research Methods	3
JUS 501	Justice Theory	3
JUS 509	Statistical Problems in Justice Research	3
JUS 521	Qualitative Data Analysis and Evaluation.....	3

Elective Courses. Offered by the School of Justice Studies and other academic units, elective courses develop a unique

GRADUATE PROGRAMS AND COURSES

research area in justice studies. Students may choose these courses in consultation with their advisory committees. Alternatively, students may choose one of the following areas within justice studies:

1. adolescence and justice;
2. American Indian justice;
3. comparative justice;
4. crime and justice;
5. dispute resolution;
6. gender and justice;
7. law, ecology, and society;
8. law, policy, and evaluation;
9. race, ethnicity, and justice; or
10. social and economic justice.

Thesis Requirements. To satisfy the research requirement for the Master of Science degree, candidates must write a thesis and defend it in an oral examination.

Applied Project Requirements. Candidates pursuing the applied project option must present their applied project and defend it in an oral examination conducted by the faculty member who supervises the project. The project should be an analytical report.

Concurrent M.A. Anthropology/M.S. Justice Studies. Graduate students in the School of Justice Studies and the Department of Anthropology are able to receive a concurrent Master of Science degree in Justice Studies and Master of Arts degree in Anthropology with a concentration in sociocultural anthropology. The program is designed for individuals with combined and complementary knowledge and skills. It prepares them for basic and applied research and administrative and educational activities related to justice studies and anthropology. Students must apply and be admitted separately to each program in accordance with the guidelines of the Graduate College, the Department of Anthropology, and the School of Justice Studies.

Foreign Language Requirements. None.

Financial Assistance. A limited number of assistantships are available on a competitive basis for well-qualified students at the master's level. To be eligible for an assistantship, students must be admitted to a graduate degree program with regular admission status. Application should be made directly to the School of Justice Studies.

JUSTICE STUDIES (JUS)

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 515 Comparative Justice. (3)

once a year
Focuses on justice, legality, and human rights cross-culturally, examining both theoretical and methodological issues. Seminar.

JUS 521 Qualitative Data Analysis and Evaluation. (3)

once a year
Analyzes qualitative data, e.g., field notes, in-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 555 Migration/Immigration and Justice. (3)

selected semesters
Explores the causes and consequences of immigration to the United States and the incorporation of immigrants into the American economy and society. Seminar.

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 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 integration of theory and practice. Placements are arranged through consultation with students and agencies.

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)

selected semesters

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.

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.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

Justice Studies

Interdisciplinary Doctoral Program

www.asu.edu/copp/justice

480/965-7083

WILSN 370

John Johnson, Director

Administration of Justice (ASU West)

Associate Professor: Haarr

Anthropology

Professor: Brandt

Chicana and Chicano Studies

Associate Professor: Escobar

Communication

Professors: Carlson, Nakayama

Associate Professor: Corey

Assistant Professor: Trethewey

Curriculum and Instruction

Professor: Edelsky

English

Professor: Sands

History

Professors: Davis, Fuchs

Humanities

Assistant Professor: Baker

Justice Studies

Regents' Professor: Altheide

Professors: Cavender, Figueira-McDonough, Haynes, Hepburn, Johnson, Jurik, Lauderdale, Musheno, Romero, Schneider, Zatz

Associate Professors: Bortner, Lujan, Menjivar, Riding In

Assistant Professors: Adelman, Afflitto, Hanson, Lopez

Languages and Literatures

Regents' Professor: Foster

Professor: Baldini

Law

Regents' Professor: Murphy

Professors: Bartels, Lowenthal, Saks, Stanton, Strouse, Tesón, Tsosie

Clinical Professor: Dauber

Philosophy

Regents' Professor: Murphy

Associate Professors: de Marneffe, McGregor

Political Science

Associate Professors: Ashley, Dantico, Doty, Simhony

Psychology

Regents' Professor: Russo

Professor: Lanyon

Psychology in Education

Associate Professor: Moore

Recreation Management and Tourism

Professor: Allison

Religious Studies

Associate Professor: Gereboff

Social Work

Professor: Ashford

Sociology

Professors: Kronenfeld, Nagasawa, Thomas

Associate Professor: Benin

Women's Studies

Associate Professor: Ferraro

Assistant Professor: Anderson

The Committee on Law and the Social Sciences (COLASS) offers an interdisciplinary graduate program leading to the Ph.D. degree in Justice Studies. Faculty are from a large number of academic units and provide the students with an opportunity to tailor their courses of study to fit individual needs and goals. COLASS committee members represent the following departments: Anthropology, Communication, Languages and Literatures, History, Management, Philosophy, Political Science, Psychology, Recreation Management and Tourism, Religious Studies, Sociology, the College of Law, and the Schools of Justice Studies and Social Work. An executive committee, appointed by the dean of the Graduate College from this larger body of faculty, has the primary responsibility for the operation of the Ph.D. program.

DOCTOR OF PHILOSOPHY

The Ph.D. degree in Justice Studies integrates philosophical, legal, historical, and social science approaches to the study of law and justice in society.

GRADUATE PROGRAMS AND COURSES

This interdisciplinary program aims to produce scholars whose research activities contribute to the knowledge and understanding of conflicts and dilemmas surrounding social change. Courses on the study of justice are a part of the curriculum of many academic disciplines, and academic books and journals increasingly stress issues of justice and injustice. In addition to the interdisciplinary programs featuring justice, students may enter academic programs that focus on business administration, class, ecology, gender, law, public administration, and race. Justice Studies graduates from the interdisciplinary Ph.D. program have a strong theoretical background, interdisciplinary training in law, humanities, and the social sciences, and possess the technical skills associated with both qualitative and quantitative research methodologies. These qualifications can provide graduates with the opportunity to successfully compete for a variety of positions in academic and justice-related fields.

Admission. Applications are reviewed on an annual basis by an admissions committee representing COLASS. Recommendations for admission are made by the director of the Executive Committee to the dean of the Graduate College. In addition to meeting minimum Graduate College admission requirements, each applicant must provide a statement of educational and career goals and the reasons for seeking the interdisciplinary Ph.D. in Justice Studies, a Graduate Record Examination test score or the Law School Admission Test score, a sample of written work, and three letters of recommendation, preferably from academic referees. Application to the program may be made at anytime. However, complete files must be submitted to the Graduate College by January 1 for the following fall semester. Because of enrollment limits, candidates who meet minimum requirements cannot automatically be admitted.

Advisory Committee. An advisory committee consisting of the committee chairperson and at least two other members, must represent a minimum of two disciplines and be from two different academic units. The dean of the Graduate College, upon the recommendation of the director of COLASS, appoints this committee. The advisory committee assists the students in developing programs of study, assumes primary responsibility for assessing the students' academic progress, and prepares and evaluates the comprehensive examination.

Core Courses. Five core courses are required of all students in the program. The core courses are taken within the first three semesters of the student's program of study. Each core course is interdisciplinary in nature.

JUS 610 Law and the Social Sciences.....	3
JUS 620 Justice Research and Methods	3
JUS 630 Data Analysis for Justice Research.....	3
JUS 640 Theoretical Perspectives on Justice.....	3
JUS 650 Advanced Qualitative Data Analysis	3
Total	15

Areas of Concentration. Students use elective courses to develop a specialization in an area relevant to justice studies from a law and social sciences perspective. The specialization is developed through consultation with the student's advisory committee. Five areas of concentration have been

established, based on the research and teaching expertise of participating faculty.

1. criminal and juvenile justice;
2. dispute resolution;
3. law, justice, and minority populations;
4. law, policy, and evaluation; and
5. women, law, and justice.

From these broad concentrations, students can develop areas of study emphasizing

1. adolescence and justice;
2. American Indian justice;
3. comparative justice;
4. crime and justice;
5. dispute resolution;
6. gender and justice;
7. law, ecology, and society;
8. law, policy, and evaluation;
9. race, ethnicity, and justice; and
10. social and economic justice.

Students may develop other areas of study in consultation with their advisory committee. Courses are not limited to those departments and schools participating in the Committee on Law and Social Sciences.

Program of Study. Students entering the program with a master's degree in the social sciences, philosophy, a relevant interdisciplinary field, or a Juris Doctorate (J.D.), must complete a minimum of 54 semester hours of study beyond the master's or J.D. degree, including 24 semester hours of dissertation and research. Applicants holding only the baccalaureate degree are required to complete a total of 84 semester hours. At least 30 hours of the approved Ph.D. program of study must be completed after admission into the program. The Graduate College also requires that two consecutive semesters, subsequent to admission to the program, must be spent in full-time residence at ASU.

Foreign Language Requirements. None.

Comprehensive Examinations. Upon completion of course work and before the start of dissertation research, the student is given a written examination. The examination evaluates the student's accumulation of interdisciplinary knowledge and ability to communicate across disciplines. The exam is developed and administered by the student's advisory committee.

Dissertation Committee. After passing the comprehensive examination, a dissertation committee is formed and approved by the dean of the Graduate College upon the recommendation of the director of the executive committee. The dissertation committee must consist of at least three faculty members, including the dissertation committee chairperson. The committee must represent an interdisciplinary faculty, with demonstrated interdisciplinary knowledge and skills to advise the student during the formulation of the research topic and during the completion of the research and dissertation. The three-membered committee must represent

at least two disciplines and two different academic units. The dissertation and advisory committees may have different memberships.

Advancement to Candidacy. Ph.D. students will achieve candidacy status in a letter from the Graduate College dean upon (1) passing the comprehensive examination, and (2) successfully defending the dissertation prospectus.

Dissertation Requirements. The dissertation consists of a fully documented written analysis demonstrating an appropriate level of interdisciplinary skills and competence associated with a justice issue. Each student must register for a minimum of 24 semester hours of dissertation and research; 12 of these semester hours must be completed in subsequent semesters following the semester the student is advanced to candidacy.

Final Examinations. The dissertation must be defended in an oral examination. A candidate must pass the final examination within five years after completing the comprehensive examination.

Concurrent Ph.D. in Justice Studies/J.D. The purpose of the concurrent Ph.D. in Justice Studies/J.D. is to provide a rigorous education for highly qualified students interested in

pursuing academic careers in law, law and the social sciences, or law and philosophy. To seek concurrent degrees, the prospective student must first gain separate admission to the College of Law and the interdisciplinary Ph.D. program in Justice Studies. The student must then obtain special approval to pursue concurrently the J.D. and Ph.D. degrees. No more than three students a year are admitted into the concurrent degree program.

COURSES

For courses, see "Justice Studies (JUS)," page 242.

Languages and Literatures

Master's and Doctoral Programs

www.asu.edu/clas/dll

480/965-6281

LL 440

Deborah N. Losse, Chair

Regents' Professors: Foster, Keller

Professors: Alexander, Baldini, Ballon-Aguirre, Chambers, Couch, Croft, Ekmanis, Guntermann, Honegger, Horwath, Losse, Valdivieso, Volek, Wetsel, Williams, Wixted, T. Wong

Associate Professors: Acereda, Candela, Cota-Cárdenas, Carlos Garcia-Fernandez, Carmen Garcia-Fernandez, W. Hendrickson, Hernández-G., Lafford, Ossipov, Reiman, Sanchez, Senner, Suwarno, Tompkins, Urioste-Azcorra, Vitullo

Assistant Professors: Burton, Canovas, Cashman, Choi, Colina, George, Ginsburg, Gruzinska, Haberman, Orlich, Rees, Tipton

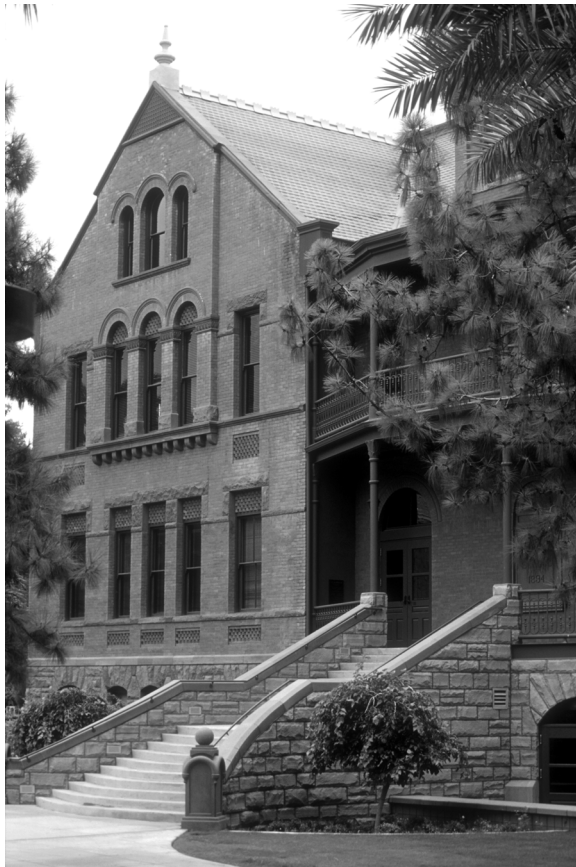
Lecturers: Foard, S. Hendrickson, Lage, Martinez, Sherman, Stiftel, Walton-Ramirez, E. Wong

Instructors: Deal, Le, Oh, Pang

Academic Associate: Glessner

The faculty in the Department of Languages and Literatures offer graduate programs leading to the M.A. degree in Asian Languages and Civilizations—Chinese/Japanese, French, German, and Spanish. For concentrations available under each major, see the "College of Liberal Arts and Sciences Graduate Degrees and Majors" table, page 75.

Students admitted to the Master of Education degree program in Secondary Education may elect foreign languages as the subject matter field. See "Master of Education," page 181, for information on the Master of Education degree.



Old Main

Tim Trumble photo

GRADUATE PROGRAMS AND COURSES

The faculty also offer a graduate program leading to the Ph.D. degree in Spanish. See “Doctor of Philosophy,” page 96, for general requirements.

It is recommended, but not required, that students applying for admission to the M.A., M.Ed., or Ph.D. program submit scores on the Graduate Record Examination.

The department also offers a Certificate in Translation.

MASTER OF ARTS

Candidates for the M.A. degree should, upon entrance, present the equivalent of an undergraduate major in the language in which the degree is sought. Those who lack this background, but who show strong potential and meet Graduate College admissions requirements, may be admitted to a graduate program on a provisional basis, pending removal of specified deficiencies. These deficiencies must be completed in addition to the regular program of study for the master’s degree.

Students in all graduate programs are expected to maintain a high level of linguistic fluency acceptable to a native speaker. Before acceptance in the program, applicants may be requested to furnish evidence of their proficiency.

The program of study for the M.A. degree includes a minimum of 30 semester hours of graduate-level work, as approved by the candidate’s supervisory committee. The program must include a 500-level Bibliography and Research Methods course offered by the department. When approved by the candidate’s supervisory committee, in some programs, nine hours in another language or in closely related courses may be included in the program.

Students who are primarily interested in teaching on the secondary or community college levels may select a program of study with a concentration in language and cultures. Students seeking an M.A. degree in Asian Languages and Civilization or in Spanish, should consult with the respective director of Graduate Studies.

Comprehensive Examinations. All candidates are required to pass a comprehensive written or oral examination designed to evaluate the candidate’s knowledge in the area of specialization. A reading list is provided as a guide to preparation for this examination.

Thesis Requirements. There are two options. The thesis option is required for students intending to pursue doctoral studies. In French, there is a portfolio option thesis equivalent for students intending to teach in K–12 or the community colleges; however, such students may also choose the thesis option. See the director of graduate studies to inquire about the two options. Students seeking an M.A. degree in Spanish have a thesis option only. Consult the *Spanish Graduate Handbook* for further information.

Final Examinations. A final oral examination in defense of the thesis is required.

DOCTOR OF PHILOSOPHY

The Ph.D. degree is offered with a major in Spanish with concentrations in literature or cultural studies.

Program of Study. A student’s individual program of courses covering the various periods of Spanish and Latin

American literature and/or culture, as well as the historical and political background of both areas, is determined in consultation with the supervisory committee. Specifically required as prerequisites are SPA 500 Bibliography and Research Methods, SPA 545 Concepts of Literary Criticism (for a concentration in literature), and SPA 598 ST: Cultural Studies/Semiotics of Culture (for a concentration in cultural studies).

At least 15 graduate credits must be earned in the subfield, and the candidate’s program of study in the subfield must be approved by the subfield department. Normally the comprehensive examination on the subfield, administered by the subfield department, must be satisfied before the comprehensive examination in Spanish. Students are urged to consult the *Spanish Graduate Handbook*.

Foreign Language Requirements. Each candidate is expected to demonstrate a reading knowledge of two languages other than Spanish. The language requirements must be satisfied before the candidate is eligible to take the comprehensive examination.

Comprehensive Examinations. A written and oral comprehensive examination, designed to ascertain the candidate’s knowledge and orientation in the field of study and competency to proceed with the dissertation, is required at or near the end of course work.

Dissertation Requirements. The candidate must present an acceptable dissertation based on original investigation. The dissertation must represent a significant contribution to knowledge and demonstrate the candidate’s ability to do independent, scholarly research.

Final Examinations. A final oral examination is required. This examination covers the subject matter of the dissertation and appropriate field.

CERTIFICATE IN TRANSLATION

The Certificate in Translation program is designed to provide the advanced training required for professional translation in both the 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 semester hours of in-service practicum primarily into the receptor language of English from the source language of Spanish. The practicum 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.

RESEARCH ACTIVITY

Faculty in the Department of Languages and Literatures conducts a wide array of research on topics relating to languages and cultures of the world. Of particular interest are contemporary and urban topics relating to the 20th-century and beyond, with special emphasis on urban studies, gender issues/sexual identities, popular culture, film, theater, and print media. Current pedagogical issues relating to language acquisition figures prominently in the department, as do technological developments. These include the teaching of languages and cultures, and the accessibility to and distribution of information regarding regions and topics of interest to faculty and students.

Spanish Research Activity. In addition to broad coverage of peninsular and Spanish-American literary and cultural topics, particular regional emphases lie within the U.S. Southwest, Mexico, Central America, the Caribbean, the Andes, and the River Plate. Specific research projects by Spanish faculty members include topics in Chicano and Latino literature, literary translation, Hispanic literary bibliography, contemporary literary theory, Spanish-American colonial literature, Argentine narrative, contemporary Mexican and Centro-American literature, contemporary Spanish and Spanish-American poetry, Spanish-American oral tradition, Hispanic women writers, Latin American popular culture, Spanish-American Jewish writers, gender and queer studies, contemporary Spanish and Spanish-American theater and film, Spanish-American postmodern culture, prose narrative of the Golden Age, Hispanic linguistics and bilingualism/sociolinguistics, and various topics in Brazilian literature.

CHINESE (CHI)

CHI 500 Bibliography and Research Methods. (3)

selected semesters

Introduces research materials on China in Chinese, Japanese, and Western languages. Overview of research methods. Lecture, discussion.

CHI 514 Advanced Classical Chinese. (3)

selected semesters

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)

selected semesters

Theory and practice of teaching Chinese, including presentation, interaction, and evaluation, with consideration given to cultural factors. Lecture, discussion.

CHI 535 Advanced Readings. (3)

selected semesters

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)

selected semesters

Theories and practice of translation: strategies for handling a variety of Chinese texts. Lecture, discussion.

CHI 591 Seminar. (3)

selected semesters

Topics in literary, linguistic, or cultural studies.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

FOREIGN LANGUAGES (FLA)

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)

selected semesters

Advanced methods seminar, designed for experienced teachers.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

FRENCH (FRE)

FRE 415 French Civilization I. (3)

spring

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.

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.

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)

spring

Analyzes French syntactic structure by contemporary theoretical models. Prerequisite: ASB 480 or ENG 213 or FLA 400.

FRE 424 French Phonology. (3)

selected semesters

Introduces phonological theory and its application to French. Prerequisites: both FRE 311 and 312 or only instructor approval.

FRE 441 French Literature of the 17th Century. (3)

fall

From 1600 to 1660. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.

FRE 442 French Literature of the 17th Century. (3)

spring

From 1660 to 1700. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.

FRE 445 French Literature of the 18th Century. (3)

selected semesters

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.

FRE 451 French Poetry of the 19th Century. (3)

spring

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)

fall

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.

GRADUATE PROGRAMS AND COURSES

FRE 453 Theater of the 19th Century. (3)

spring

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.

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.

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.

FRE 471 The Literature of Francophone Africa and the Caribbean. (3)

fall

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.

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 480 Translation Theory and Practice. (3)

spring

Theoretical and practical approaches to the fundamentals of meaning-based translation. Lecture, seminar. Prerequisite: FRE 412 or instructor approval.

FRE 482 Business Translation. (3)

fall

Practical approach to meaning-based translation through exposure to a variety of business texts. Prerequisite: FRE 312 or instructor approval.

FRE 485 Literary Translation. (3)

spring

Theory and practice of literary translation with emphasis on application through individual translation project. Prerequisite: FRE 480.

FRE 500 Bibliography and Research Methods. (3)

fall

Required of all graduate students.

FRE 510 Explication de Textes. (3)

selected semesters

Detailed analysis of literary texts.

FRE 515 Intellectual Currents in France, from the Middle Ages to the 18th Century. (3)

selected semesters

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)

selected semesters

See FRE 515.

FRE 521 History of the French Language. (3)

spring

Principal phonological, morphological, and semantic developments of French from Latin to present, with emphasis on Old and Middle French. Prerequisite: some familiarity with Latin 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)

fall

Readings in French Renaissance literature with special attention to the humanist movement and to Rabelais, Montaigne, and the Pleiade.

FRE 580 Translation Theory and Practice. (3)

spring

Theoretical and practical approaches to the fundamentals of meaning-based translation. Lecture, seminar. Prerequisite: FRE 412 or instructor approval.

FRE 582 Business Translation. (3)

fall

Practical approach to meaning-based translation through exposure to a variety of business texts. Prerequisite: FRE 312 or instructor approval.

FRE 585 Literary Translation. (3)

spring

Theory and practice of literary translation with emphasis on application through individual translation project. Lecture, seminar. Prerequisite: FRE 480.

FRE 591 Seminar. (1–12)

selected semesters

Topics may include the following:

- Advanced Problems in French Literature. (3)
- Balzac. (3)
- Corneille, Molière, and Racine. (3)
- Diderot, Voltaire, and Rousseau. (3)
- Flaubert. (3)
- French Existentialist Literature. (3)
- French Literary Criticism. (3)
- Proust. (3)
- Realism and Naturalism. (3)
- Romanticism. (3)
- Stendhal and Zola. (3)

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

GERMAN (GER)

GER 421 German Literature. (3)

fall

From the beginning to Classicism. Prerequisite: 6 hours of 300-level German.

GER 422 German Literature. (3)

spring

From Romanticism to the present. Prerequisite: 6 hours of 300-level German.

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.

GER 500 Bibliography and Research Methods. (3)

selected semesters

Required of all graduate students.

GER 511 German Stylistics. (3)

selected semesters

Art of writing literary German, comparative stylistics.

GER 521 History of German Language. (3)

selected semesters

Linguistic development of German from the earliest records to the present.

GER 523 German Drama. (3)

selected semesters

Drama of the 19th and 20th centuries.

GER 525 German Novel. (3)

selected semesters

Special studies in the German novel.

GER 527 The *Novelle*. (3)

selected semesters

Special studies in the German short story.

GER 531 Middle High German Language and Literature. (3)

selected semesters

Reading and discussion of specimens of the Middle High German epics, romances, and other literary genres.

GER 551 Romanticism. (3)

selected semesters

Treatment of early and late Romanticism.

GER 555 Modern German Literature. (3)

selected semesters

Major works from the period of Expressionism to 1945.

GER 591 Seminar. (1–12)

selected semesters

Special topics are concerned with a figure, theme, or work in German literature or Germanic studies. Topics may include the following:

- Faust. (3)
- Germanic Studies. (3)
- Goethe. (3)
- Grass and Böll. (3)
- Hesse. (3)
- Kafka. (3)
- Kleist. (3)
- Schiller. (3)

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see “Omnibus Courses,” page 48.

JAPANESE (JPN)

JPN 500 Bibliography and Research Methods. (3)

selected semesters

Introduces research materials on Japan both in Japanese and in Western languages. Overview of research methods. Lecture, discussion.

JPN 514 Advanced Premodern Japanese. (3)

selected semesters

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)

selected semesters

Theory and practice of teaching Japanese, including presentation, interaction, and evaluation, with consideration given to cultural factors. Lecture, discussion.

JPN 535 Advanced Readings. (3)

selected semesters

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)

selected semesters

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)

selected semesters

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)

selected semesters

Topics in literary, linguistic, or cultural studies.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see “Omnibus Courses,” page 48.

RUSSIAN (RUS)

RUS 591 Seminar. (3)

selected semesters

Topics in literary, linguistic, or other cultural studies.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see “Omnibus Courses,” page 48.

SPANISH (SPA)

SPA 500 Bibliography and Research Methods. (3)

fall

Required of all graduate students.

SPA 536 Generation of 1898. (3)

selected semesters

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).

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)

selected semesters

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)

selected semesters

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)

selected semesters

Major figures and works of the Middle Ages in Spain.

SPA 561 Golden Age Spanish Prose Fiction. (3)

selected semesters

Major figures and works of the 16th and 17th centuries, with emphasis on the picaresque novel.

SPA 562 Golden Age Spanish Poetry. (3)

selected semesters

Major figures and works of the 16th and 17th centuries, with emphasis on lyric poetry.

SPA 563 Spanish Romanticism. (3)

selected semesters

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)

selected semesters

Principal figures and works of realism in the 19th-century novel, with emphasis on Galdós.

SPA 565 20th-Century Spanish Drama. (3)

selected semesters

Principal figures and works of Spanish dramatic literature from the Generation of 1898 to the present.

SPA 566 Generation of 1927. (3)

selected semesters

Major poets of the Generation of 1927, with emphasis on works of Lorca, Guillén, Salinas, and Aleixandre.

SPA 567 Contemporary Spanish Novel. (3)

selected semesters

Major works of post-Civil War Spanish fiction.

GRADUATE PROGRAMS AND COURSES

SPA 568 Cervantes. (3)

selected semesters

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)

selected semesters

Indigenous literary traditions, with emphasis on Nahuatl, Mayan, and Quechua literatures through readings in Spanish translations.

SPA 571 Colonial Spanish American Literature. (3)

selected semesters

Major figures and works from conquest to independence.

SPA 572 Spanish American Drama. (3)

selected semesters

Major contributions of Spanish American drama, with emphasis on contemporary dramatists.

SPA 573 Spanish American Essay. (3)

selected semesters

Major works of the essay, within the framework of intellectual history and literary movements.

SPA 574 Spanish American Vanguard Poetry. (3)

selected semesters

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)

selected semesters

Principal novels of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

SPA 576 Contemporary Spanish American Short Story. (3)

selected semesters

Principal short stories of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

SPA 577 Regional Spanish American Literature. (3)

selected semesters

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)

selected semesters

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)

selected semesters

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)

selected semesters

Examines the role of film in contemporary Latin American culture; films viewed and analyzed as casebook examples. Seminar.

SPA 591 Seminar. (3)

selected semesters

Spanish and Spanish American literary, cultural, and linguistic topics.

SPA 598 Special Topics. (1–4)

selected semesters

Topics may include the following:

- Cultural Studies/Semiotics of Culture

SPA 691 Figures and Works Seminar. (3)

selected semesters

Topics may be selected from Spanish and Spanish American literatures

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

Law

Doctoral and Certificate Programs

law.asu.edu

480/965-6181

LAW 201

Patricia D. White, Dean

Directors

Marchant, Center for the Study of Law, Science, and Technology; O'Grady, Clinical Programs; Stinson, Legal Research and Writing and Academic Support; Tsosie, Indian Legal Program

Regents' Professors: Kaye, Murphy

Professors: Arterian, Bartels, Bender, Berch, Brennan, Calleros, Clinton, Ellman, Feller, Furnish, Gorman, Grey, Guerin, Jones, Kader, Karjala, Leshy, Lowenthal, Lynk, Matheson, O'Grady, Rose, Saks, Schatzki, Schroeder, Stanton, Strouse, Tesón, Tsosie, Tucker, Weinstein, White, Winer, Woodley

Associate Professor: Marchant

Clinical Professor: Dauber

Clinical Professional: Dallyn

For more information about the College of Law programs, see "College of Law," page 71.

LAW (LAW)

LAW 500 Holding Registration. (1–16)

fall and spring

LAW 515 Contracts I. (3)

fall

Explores common law legal method and the structure of Article 2 of the U.C.C. in the context of issues of contract formation.

LAW 516 Criminal Law. (3)

fall

Substantive law of crimes.

LAW 517 Torts I. (2–4)

spring

Legal protections of personality, property, and relational interests against physical, economic, and emotional harms.

LAW 518 Civil Procedure I. (3)

fall

Explores the structure of a lawsuit and techniques of alternative dispute resolution. Specific topics include commencement of suit, joinder of parties, discovery, pretrial motions, and subject matter jurisdiction.

LAW 519 Legal Method and Writing. (2)

fall

Examines methods used to analyze legal problems. Reviews precedent statutory construction and basic *res judicata* problems. Use of basic legal writing formats.

LAW 520 Contracts II. (2)

spring

Continuation of LAW 515 focusing on contract interpretation.

LAW 522 Constitutional Law I. (3)*spring*

Role of courts in the federal system, distribution of powers between state and federal governments, and the role of procedure in litigation of constitutional questions.

LAW 523 Property I. (2–3)*fall*

Indicia of ownership, found property, estates in land, landlord tenant.

LAW 524 Legal Research and Writing. (2)*spring*

Continuation of LAW 519.

LAW 525 Torts II. (2)*spring*

Continuation of LAW 517 with emphasis on strict and products liability.

LAW 526 Property II. (2–3)*spring*

Nonpossessory interests in property (easements, covenants, servitudes); nuisance; land use planning; and transfers of interests in property.

LAW 527 Civil Procedure II. (3)*spring*

Continuation of LAW 518; subjects in LAW 518 are addressed in greater depth as well as personal jurisdiction, res judicata, collateral estoppel, and choice of law under the *Erie* doctrine.

LAW 600 Administrative Law. (3)*once a year*

Administrative process, emphasizing nature of powers exercised by administrative agencies of government, problems of procedure, and scope of judicial review.

LAW 601 Antitrust Law. (3)*once a year*

Legislation and its implementation to prevent monopoly and business practices in restraint of trade, including restrictive agreements involving price-fixing, trade association activities, and resale price maintenance.

LAW 602 Partnership Taxation. (2–3)*selected semesters*

Federal tax consequences of forming, operating, terminating, or transferring partnerships.

LAW 603 Conflict of Laws. (3)*selected semesters*

Problems arising when the operative facts of a case are connected with more than one state or nation. Choice of law, bases of jurisdiction, effect of foreign judgments, and underlying federal and constitutional issues.

LAW 604 Criminal Procedure. (3)*fall and spring*

Nature of the criminal procedural system with special focus on constitutional protections for the accused.

LAW 605 Evidence. (3)*once a year*

Principles and practice governing the competency of witnesses and presentation of evidence, including the rules of exclusion and roles of lawyer, judge, and jury under the adversary system.

LAW 606 Federal Income Taxation. (3–4)*fall and spring*

Federal income tax in relation to concepts of income, property arrangement, business activity, and current tax problems, with focus on the process of tax legislation and administration.

LAW 607 Advanced Civil Procedure. (3)*fall and spring*

Overview of the structure and life cycle of a lawsuit from pleadings to appeal, emphasizing the Federal Rules of Civil Procedure.

LAW 608 Business Associations I. (3)*once a year*

Partnerships, limited partnerships, and small business corporations. Includes a brief introduction to accounting. Detailed analysis of the problems of forming a close corporation, state law duties of care and loyalty, management, dividends and redemptions, issuance of stock, internal dispute resolution, dissolution, and the general law of derivative actions.

LAW 609 Business Associations II. (3)*once a year*

Interrelationship of federal and state law and a brief introduction to corporate finance (1933 Act). Broad overview of large company regulations including reporting rules, proxy regulation, insider trading, sale of control, tender offers and takeovers, and going private. Prerequisite: LAW 608.

LAW 610 Advanced Criminal Procedure. (2–3)*once a year*

Topics in criminal procedure, with emphasis on legal constraints on grand jury investigations, police practices, pretrial release, preliminary hearings, prosecutorial discretion, and plea bargaining.

LAW 611 Estate Planning I. (2–3)*selected semesters*

Tax laws relating to transfer of wealth both at death and during lifetime, including federal estate tax, gift tax, and income taxation of estates and trusts.

LAW 612 Family Law. (3)*once a year*

Legal and nonlegal problems that an individual may encounter because of a situation as a family member.

LAW 613 Federal Courts. (3)*selected semesters*

Federal judicial system; relationship of federal and state law; jurisdiction of federal courts and their relation to state courts.

LAW 614 Labor Relations. (3)*selected semesters*

Collective bargaining, including the right of employees to organize and to engage in concerted activities; resolution of questions concerning the representation of employees; duty of employers and unions to bargain; administration and enforcement of collective bargaining agreements.

LAW 615 Public International Law. (3)*once a year*

Role of law in international disputes. Considers drafting and interpretation of treaties and multilateral conventions.

LAW 616 Jurisprudence. (3)*once a year*

Introduces legal philosophy, with readings on the nature of law and legal reasoning, the relationship between law and morality and equality and social justice.

LAW 618 Trusts and Estates. (3)*once a year*

Substantive concepts involved in transmitting wealth, including interstate succession, wills and will substitutes, the modern trust as a family protective device, creation of future interests in a planned estate, social restrictions of a nontax nature, and methods of devoting property to charitable purposes.

LAW 619 Commercial Law: Payment and Credit Systems. (3)*fall*

Law of credit obligations and payment devices. Focuses on Articles 3, 4, and 4A of the Uniform Commercial Code.

LAW 620 Civil Rights Legislation. (2–3)*selected semesters*

Coverage of the rights and remedies provided by federal civil rights legislation, principally, the key provisions of the Reconstruction Era Civil Rights Acts, portions of the employment discrimination legislation, and voting rights legislation.

LAW 621 Commercial Law: Sales and Leases of Goods. (3)*spring*

Advanced issues involving the formation and interpretation of sales and lease contracts. Focuses primarily on Articles 2 and 2A of the Uniform Commercial Code.

LAW 622 Commercial Law: Secured Transactions. (3)*once a year*

Secured transactions under Article 9 of the Uniform Commercial Code and other relevant sections. Overview of the creation, perfection, and priority effects of security interests. Financing of business enterprise and consumer credit.

GRADUATE PROGRAMS AND COURSES

LAW 623 Commercial Torts. (3–4)

once a year

Involves an analysis of actionable wrongs against a business entity or against proprietary rights held by that entity, covering the entire spectrum of private remedies for competitive wrongs.

LAW 624 Community Property. (1–2)

fall and spring

Property rights of husband and wife; the Arizona community property system; homestead.

LAW 625 Constitutional Law II. (3–4)

fall, spring, summer

Fundamental protection for person, property, political, and social rights.

LAW 627 Corporate Taxation. (2–3)

once a year

Problems in taxability of the corporation, corporate distributions, and corporate reorganizations.

LAW 628 Creditor-Debtor Relations. (3)

once a year

Creditors' remedies in satisfaction of claims and debtors' protection and relief under bankruptcy, other laws.

LAW 629 Employment Law. (3)

once a year

Employment law topics including testing, privacy, OSHA, FLSA, benefits, worker's compensation, rights to compensation, workplace emotional injuries, termination, and sexual harassment.

LAW 630 Employment Discrimination. (2–3)

selected semesters

Focuses primarily on Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act.

LAW 631 Environmental Law. (3)

once a year

Litigation, administrative law, and legislation relating to problems of environmental quality. Topics covered may include air and water pollution, toxic substances, pesticides, and radiation.

LAW 632 Indian Law. (3)

once a year

Inquiry into legal problems special to American Indians and tribes.

LAW 634 Judicial Remedies. (3)

once a year

Nature and limits of injunctive, restitutionary, and compensatory remedies for the protection of personal, property, political, and civil rights.

LAW 635 Juvenile Justice System. (3)

selected semesters

Special problems in the juvenile system.

LAW 636 Land Use Regulation. (2–3)

once a year

Legal problems in the regulation and control of land development by state and local governments. Administration of zoning, subdivision, and other planning controls; issues of fairness and procedure in the utilization of such controls.

LAW 637 Lawyering Theory and Practice. (4)

fall and spring

Issues of competency and professionalism in the practice of law.

LAW 638 Professional Responsibility. (3)

fall and spring

Emphasizes the Model Rules and Model Code that govern the professional responsibility of lawyers and their interpretation and application.

LAW 639 Natural Resource Law. (3)

once a year

Examines the constitutional basis for federal land management and the different kinds of public lands management schemes (e.g., parks, forests, wildlife refuges), emphasizing acquisition of right to, and regulation of, the different uses of public lands and resources (e.g., mining, grazing, timber, wildlife habitat, recreation).

LAW 640 Securities Regulation. (2)

once a year

Selected problems arising under the major statutes concerned with regulating the securities market.

LAW 641 State and Local Government. (2–3)

selected semesters

Legal problems involved in the organization and administration of governmental units, including the city, county, town, village, school district, and special district.

LAW 642 White Collar Crime. (2–3)

once a year

Examines the ways in which "white collar" crime is prosecuted, principally in the federal system.

LAW 643 Water Law. (3)

once a year

Acquisition of water rights; water use controls; interstate conflicts.

LAW 644 Intellectual Property. (3)

once a year

Protection of intellectual property and encouragement of creativity—trade values, trade secrets, patents, copyrights, performing arts, and visual arts.

LAW 645 Patent Law. (3)

once a year

In-depth examination of substantive patent law as it applies to the commercialization and enforcement of patent rights.

LAW 646 Copyright Law. (3)

once a year

Legal rights in original forms of human expression.

LAW 647 Mass Tort Litigation. (2–3)

once a year

Examines unique procedural and substantive issues that arise in mass tort litigation.

LAW 701 Arbitration. (2–3)

once a year

Examines the Federal Arbitration Act and the Uniform Arbitration Act as it has been adopted in Arizona.

LAW 702 Alternative Dispute Resolution. (2–3)

once a year

Broad exposure to methods of settling disputes in our society such as mediation, arbitration/conciliation, and negotiation, including examination of the current litigation model.

LAW 703 Law, Science, and Technology. (2–3)

once a year

Legal mechanisms used in dealing with various issues raised by contemporary science and technology. Explores current legal responses to science and technology.

LAW 705 Media Law. (2–3)

once a year

Examines First Amendment principles and statutory and regulatory requirements with respect to the conventional print and broadcast media, as well as recent technologies such as cable.

LAW 706 Immigration Law. (2–3)

selected semesters

Explores political, economic, social, and legal issues concerning immigration. Specific topics covered include citizenship and naturalization, denaturalization, deportation, and refugee rights and asylum.

LAW 707 Elder Law. (2–3)

once a year

Looks at legal and policy questions related to aging individuals and an older society. Seminar.

LAW 708 Gender, Sexuality, and the Law. (2–3)

once a year

Examines assumptions made in the law about gender and sexuality and the impact of those assumptions on the application of the law. Seminar.

LAW 709 International Human Rights. (2–3)

selected semesters

International rules and procedures governing the protection of human rights.

LAW 710 Real Estate Tax Planning. (2–3)

once a year

Discusses topics, including but not limited to real estate investments as tax shelters, alternative acquisition finance devices, refinancing techniques, and nontaxable exchanges.

LAW 711 Real Estate Transfer. (2–3)*once a year*

Examines the legal aspects of the sale and purchase of real property encompassing three areas: the role of the lawyer and broker in the transaction, the sales contract, and issues relating to title protection.

LAW 712 Religion and the Constitution. (2–3)*once a year*

In-depth study of the “establishment” and “free exercise” clauses of the First Amendment to the U.S. Constitution.

LAW 714 Law and Social Science. (2–3)*selected semesters*

Investigates the use of social science research and methods in the legal system. Topics include psychology of eyewitness identification, social-psychological studies of decision making, statistical evidence of discrimination, econometric studies of the deterrent effects of capital punishment, and clinical predictions of violent behavior.

LAW 715 Professional Sports. (2–3)*selected semesters*

Unique legal problems relating to professional sports, including their relationship to antitrust laws, the nature of player contracts, and associated tax problems.

LAW 716 Timber and Range. (2–3)*once a year*

Explores legal aspects of environmental controversies surrounding timber cutting and livestock grazing on public lands. Seminar. Prerequisite: LAW 639.

LAW 717 Legislative Process. (2–3)*selected semesters*

Explores both the legal and the practical contexts within which the legislative process operates, with a major component being a legislative drafting project.

LAW 721 Education and the Law. (2–3)*selected semesters*

Current legal problems affecting institutions of higher education, faculty, students, and governing boards.

LAW 722 Mexican Law. (2–3)*fall*

Comparative overview of Mexican law. Poses questions regarding the proper role and function of a legal system. Seminar.

LAW 733 Negotiation, Mediation, and Counseling. (3)*once a year*

Explores alternative models of negotiated dispute resolution, as well as the roles of lawyer and client in the negotiation process. Extensive use of simulation exercises.

LAW 734 Products Liability. (2–3)*once a year*

Traces the development of products liability law; analyzes the major issues currently confronting the courts in this area. Seminar.

LAW 735 Estate Planning II. (2–3)*selected semesters*

Prepares actual estate plans and implements legal documents for a variety of typical private clients. Considers both tax and nontax elements in preparation of the plans. Prerequisite: LAW 611.

LAW 736 Planning for the Business Client. (2–3)*selected semesters*

Planning transactions involving business organizations with special emphasis on income tax and corporate considerations.

LAW 738 Trial Advocacy. (2–3)*fall and spring*

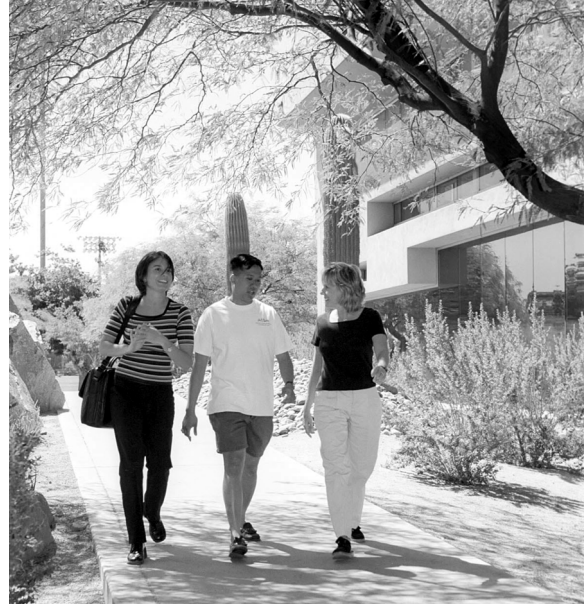
Confronts issues of trial advocacy through simulation of a variety of aspects of trial practice in a mock court setting. Prerequisite: LAW 605.

LAW 745 The Supreme Court. (2–3)*once a year*

Intensive examination of selected current decisions of the U.S. Supreme Court.

LAW 768 International Business Transactions. (2–3)*selected semesters*

Problems and policy considerations involved in international trade; tariffs, international monetary controls, and development loans.



Law students visit the John J. Ross–William C. Blakley Law Library on ASU Main campus.

Tim Trumble photo

LAW 770 Law Journal. (1–3)*fall and spring*

Academic credit for successful completion of editorial work by a member of the staff of *Arizona State Law Journal*; maximum of 5 semester hours.

LAW 771 Jurimetrics Journal. (1–3)*fall and spring*

Academic credit for successful completion of editorial work by a member of the staff of the *Jurimetrics Journal of Law, Science, and Technology*. Studio.

LAW 772 Public Defender Clinic. (1–6)*fall, spring, summer*

Placement in the Public Defender Clinic and related classroom component. Prerequisite: LAW 605.

LAW 773 Civil Practice Clinic. (1–6)*fall, spring, summer*

Placement in the Civil Practice Clinic and related classroom component. Prerequisite: LAW 605.

LAW 774 Criminal Practice Clinic. (1–6)*fall, spring, summer*

Placement with various prosecutor offices in the Phoenix area and related classroom component. Prerequisite: LAW 605.

LAW 775 Mediation Clinic. (1–4)*fall and spring*

Study of the mediation process and experience as mediators in cases pending before the justice courts and administrative agencies.

LAW 780 Moot Court. (1–3)*fall and spring*

Academic credit for successful completion of work as a member of the Moot Court Board of Directors; maximum of 3 semester hours.

LAW 781 Individual Study. (1)*fall, spring, summer*

With the approval of a faculty member, a student may research a legal subject of special interest and prepare a paper suitable for publication.

LAW 782 Individual Study. (2)*fall, spring, summer*

See LAW 781.

LAW 783 Individual Study. (3)*fall, spring, summer*

See LAW 781.

GRADUATE PROGRAMS AND COURSES

LAW 784 Moot Court Competition. (1–4)

fall and spring

Successful participation and completion of a national moot court competition.

LAW 785 Externship. (1–12)

fall, spring, summer

Supervised, practical lawyering in an external placement proposed by the student or established by a sponsoring agency and approved by the College of Law. In addition, an associated academic component is established by the student with a member of the faculty.

LAW 791 Seminar in Law. (1–12)

fall and spring

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see “Omnibus Courses,” page 48.

Mass Communication

Master’s Program

cronkite.pp.asu.edu/grad

480/965-5011

STAUF A231B

Joe Foote, Director

Professors: Craft, Cronkite, Doig, Foote, Godfrey, Merrill, Sylvester, Watson, Youm

Associate Professors: Allen, Barrett, Bramlett-Solomon, Galician, Lentz, Matera, Russell, Russomanno

Assistant Professors: Keith, Silcock

Clinical Professor: Leigh

Lecturers: Casavantes, Nichols

MASTER OF MASS COMMUNICATION

The faculty in the Walter Cronkite School of Journalism and Mass Communication offer a graduate program leading to the professional degree Master of Mass Communication (M.M.C.). The program is designed to help students achieve academic and professional growth, to prepare students for positions in the mass media, and to provide a background to enable persons currently in the media to advance their careers.

Admission. In addition to the general requirements for admission to the Graduate College, the M.M.C. program requires applicants to provide three letters of recommendation (including two from professors in the last unit of study from degree-granting institutions), scores on either the GRE (verbal and quantitative) or the MAT, a biographical sketch or résumé that includes all professional media experience, and a 250–500 word statement outlining career aspirations that could be enhanced by admission to the program (the statement is also used as a writing sample). The applicant’s undergraduate GPA, letters of recommendation, test scores, and professional media experience are all considered in the admission process. A TOEFL score of 600 or higher is

required of all applicants whose native language is not English. Applicants wishing to enroll for fall semester must have all their application materials submitted by March 1.

Admission Classification. Applicants who have an undergraduate degree in an area of mass communication, who meet all other requirements, and who receive regular admission may begin the 36 semester hour program in the fall. A two-year program is designed for applicants who have an undergraduate degree in a discipline other than mass communication. This program consists of 45 semester hours. The first-year courses are designed to provide a foundation in journalism knowledge and skills and must be taken in prescribed sequence. Some first-semester courses are prerequisites for courses to be taken in subsequent semesters.

Registration. Registration in courses numbered 500 is limited to students who have been admitted to the M.M.C. program or have approval from the instructor of the class. Non-degree graduate students may not register for 500-level courses in the Walter Cronkite School of Journalism and Mass Communication during early registration. Undergraduate students wishing to reserve graduate course credit must follow Graduate College guidelines and obtain approval from the director of graduate studies.

Program of Study. The program consists of 36 semester hours of graduate credit for students with undergraduate degrees in the areas of mass communication. Requirements are as follows:

1. 12 hours of core course work,
2. six to 12 hours of specialization courses,
3. nine to 15 hours of a related area outside the school, and
4. three hours of supervised applied project (MCO 593).

The program consists of 45 semester hours of credit for students with undergraduate degrees in areas other than mass communication. Requirements are as follows:

1. 15 hours of core course work,
2. 12 hours of specialization courses,
3. six hours of mass communication writing skills courses,
4. nine hours of a related area outside the school, and
5. three hours of supervised applied project (MCO 593).

Foreign Language Requirements. None.

Thesis Requirements. None.

Final Examinations. An oral examination in defense of the supervised research or creative project is required.

JOURNALISM AND MASS COMMUNICATION (JMC)

JMC 401 Advanced Public Relations. (3)

fall and spring

Advanced theory and practice of publicity, public relations, and related techniques and procedures. Prerequisite: JMC 270.

JMC 412 Editorial Interpretation. (3)

selected semesters

The press as an influence on public opinion. Role of the editorial in analyzing and interpreting current events. Prerequisites: JMC 301; professional status.

JMC 413 Advanced Editing. (3)

fall and spring

Theory and practice of newspaper editing, layout and design, picture and story selection. Prerequisites: JMC 313; professional status.

JMC 414 Electronic Publication Design. (3)

fall and spring

Theory, organization, and practice of layout, typography, and design in traditional and multimedia publishing. Prerequisites: JMC 401; professional status.

JMC 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: JMC 401; professional status.

JMC 417 Public Relations Campaigns. (3)

fall and spring

Theory, principles, and literature of public relations and how they relate to audiences, campaigns, and ethics. Prerequisites: JMC 401; professional status. Corequisite: JMC 415.

JMC 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: JMC 301; professional status.

JMC 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: JMC 200; professional status.

JMC 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: JMC 235; professional status.

JMC 440 Magazine Writing. (3)

fall and spring

Writing and marketing magazine articles for publication. Prerequisites: JMC 301; professional status.

JMC 451 Photojournalism II. (3)

fall and spring

Theory and practice of photojournalism with emphasis on shooting, lighting, and layout for the media. Prerequisites: JMC 351; professional status.

JMC 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: JMC 451; professional status.

JMC 465 Precision Journalism. (3)

fall and 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: JMC 301; professional status.

JMC 470 Depth Reporting. (3)

fall and spring

Introduces strategies for writing in-depth newspaper or magazine articles. Lecture, lab. Prerequisites: JMC 301; professional status; instructor approval.

JMC 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: JMC 332; professional status.

JMC 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 status; instructor approval.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

MASS COMMUNICATION (MCO)

MCO 402 Mass Communication Law. (3)

fall, spring, summer

Legal aspects of the rights, privileges, and obligations of the press, radio, and television. Prerequisites: 87 hours; professional status.

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.

MCO 421 News Problems. (3)

fall and spring

Trends and problems of the news media, emphasizing editorial decisions in the processing of news.

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.

MCO 435 Emerging Media Technologies. (3)

fall and spring

Surveys new telecommunication technologies in a convergent environment.

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.

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.

MCO 460 Race, Gender, and Media. (3)

spring and summer

Reading seminar designed to give 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.

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 or instructor approval.

MCO 503 Press Freedom Theory. (3)

spring

Examines philosophical and legal aspects of press freedom. Emphasizes 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. Prerequisite: acceptance into M.M.C. graduate program or instructor approval.

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. Emphasizes criticism and normative statements.

GRADUATE PROGRAMS AND COURSES

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

Introduces 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)

selected semesters

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

Materials Engineering

Master's and Doctoral Programs

www.eas.asu.edu/~cme

480/965-3313

ECG 202

Subhash Mahajan, Chair

Regents' Professor: Mayer

Professors: Adams, Dey, Krause, Mahajan, Newman, Picraux, Sieradzki

Associate Professors: Alford, Van Schilfgaarde

Assistant Professor: Chawla

The faculty in the Department of Chemical and Materials Engineering offer graduate programs leading to the Master of Science (M.S.) degree, the Master of Science in Engineering (M.S.E.) degree, and the Ph.D. degree in Engineering Science with specializations in materials science and engineering (see "Engineering Science," page 197 for program description). Areas of concentration include electronic and advanced materials processing, mechanical behavior of materials, composites, thin films, ceramics, characterization and simulation of materials, and biomaterials.

The faculty also participate in offering the interdisciplinary program leading to the Ph.D. degree with a major in Science and Engineering of Materials (see "Science and Engineering of Materials," page 312, for program description). A *Graduate Student Handbook*, detailing information on studies in the Master's and Doctoral programs, is available to admitted students. For information on graduate studies in Materials Engineering, access the Web site at

www.eas.asu.edu/~cme or call the Department of Chemical and Materials Engineering at 480/965-3313.

Graduate Record Examination. Graduate Record Examination scores are required from all students.

MASTER OF SCIENCE

For more information, including general requirements, see "Master's Degrees," page 93.

Transition Program. Students applying for the program leading to a master's degree with a major in Materials Engineering may have an undergraduate B.S. degree in a major field other than Materials Engineering or Materials Science. The qualifications of transition students are reviewed by the department graduate committee and a special program is then designed for successful applicants. In general applicants should have had, or should be prepared to take, calculus through differential equations, chemistry, and physics. Transition students are expected to complete the essential courses in their area of study from the undergraduate program in order to be prepared for the graduate courses. Other course work from the undergraduate program may be required depending upon the area of study selected by the student. Transition students should contact the graduate coordinator for an evaluation of their undergraduate transcript.

Program of Study. All candidates for the M.S.E. or M.S. degree in Materials Engineering are required to complete an approved program of study consisting of the minimum required semester hours, including research report (M.S.E.) or thesis (M.S.). Special course requirements for the different areas of study are established by the faculty and are available from the departmental graduate coordinator. In addition to the course/thesis requirements, all full-time graduate students must successfully complete a seminar course during each semester of attendance. Part-time students must enroll in a seminar course at least three times during the course of study. Candidates whose undergraduate degree was in a field other than Materials Engineering or Materials Science may be required to complete more than 30 semester hours.

Thesis Requirements. A thesis or equivalent is required for the M.S. degree.

Final Examinations. A final oral examination or equivalent is required in defense of the thesis.

MASTER OF SCIENCE IN ENGINEERING

The faculty also participate in offering the tri-university Master of Engineering degree program. See "Master of Science in Engineering," page 196, for program description.

DOCTOR OF PHILOSOPHY

The Ph.D. degree in the area of study in materials science and engineering under the Engineering Science major, is conferred upon evidence of excellence in research resulting in a scholarly dissertation that is a contribution to existing knowledge. See "Doctor of Philosophy," page 96, for general requirements.

Doctoral Program. Upon successful completion of the qualifying examination, a research supervisory committee is formed and the doctoral student is required to submit a research proposal. Following acceptance of the research proposal, the student is given a comprehensive examination to determine initiative, originality, breadth, and level of professional commitment to the problem selected for investigation. Upon successful completion of the comprehensive examination, the student applies for admission to candidacy.

Foreign Language Requirements. Candidates in the program leading to the Ph.D. degree in the area of study in materials science and engineering, under the Engineering Science major, normally are not required to pass an examination showing reading competency of a foreign language. However, the supervisory committee may establish such a requirement in special cases depending upon the research interests of the candidate. If a foreign language is required, the student must successfully fulfill the requirement before taking the comprehensive examination.

Dissertation Requirement. A dissertation based on original work demonstrating creativity in research and scholarly proficiency in the subject area is required.

Final Examinations. A final oral examination in defense of the dissertation is required.

RESEARCH ACTIVITY

The research thrusts in Materials Engineering are:

1. growth, processing, and characterization of electronic materials;
2. electroceramics;
3. deformation behavior of materials at different length scales;
4. computational materials science; and
5. nanoscience and nanotechnology.

Some of the research projects that are currently being pursued are:

1. growth of group III nitrides by organometallic vapor phase epitaxy and molecular beam epitaxy and their fabrication into high frequency, high power, and high temperature devices;
2. fabrication of spintronic devices for very high frequency applications;
3. synthesis of high k dielectric films by organometallic vapor phase epitaxy and correlation of properties with microstructures;
4. process-induced defects in implantation and annealing of GaN;
5. creep and thermal fatigue behaviors of lead-free solder balls used in electronic packaging;
6. modeling of the evolution of thin film microstructures; and
7. synthesis and characterization of quantum dots.

MATERIALS SCIENCE AND ENGINEERING (MSE)

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)

spring in odd years

Introduces 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)

spring in even years

Identifies 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)

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: 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 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)

selected semesters

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)

spring

Introduces 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)

spring

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)

spring in odd years

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).

GRADUATE PROGRAMS AND COURSES

MSE 550 Advanced Materials Characterization. (3)

fall

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 rays, and energy loss 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 rays, 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)

selected semesters

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)

spring in even years

Heterogeneous and homogeneous precipitation reactions, shear displacive reactions, and order-disorder transformation.

MSE 562 Ion Implantation. (3)

selected semesters

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)

spring in even years

Relationships between structure and properties of synthetic polymers, including glass transition, molecular relaxations, crystalline state viscoelasticity, morphological characterization, and processing.

MSE 571 Ceramics. (3)

selected semesters

Includes ceramic processing, casting, molding, firing, sintering, crystal defects, and mechanical, electronic, and physical properties. Prerequisites: MSE 521, 561.

MSE 573 Magnetic Materials. (3)

selected semesters

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)

once a year

Topics may include the following:

- Growth and Processing of Semiconductor Devices. (3)

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

Materials Science

Interdisciplinary Master's Program

www.asu.edu/graduate/SEM

480/965-2460

PS A323

James B. Adams and William T. Petuskey, Codirectors

Chemical and Materials Engineering

Professors: Adams, Dey, Krause, Mahajan, Newman, Picraux
Associate Professor: Alford

Chemistry and Biochemistry

Regents' Professor: Buseck
Professor: Petuskey
Associate Professor: Kouvetakis
Assistant Professor: Matyushov

Electrical Engineering

Regents' Professor: Ferry
Professors: Goodnick, Kozicki, Schroder, Thornton, Zhang

Mechanical and Aerospace Engineering

Professor: Sieradzki

Physics and Astronomy

Regents' Professor: Smith
Professors: Bennett, Ponce, Rez, Sankey, Tsong, Venables
Associate Professors: Culbertson, Drucker, Herbots, Marzke

Solid-State Science

Professor: Carpenter
Senior Research Scientists: Crozier, McCartney, McKelvy
Associate Research Scientist: Sharma

The Science and Engineering Program of Materials Program offers an interdisciplinary master's degree in Materials Science. The members of the faculty are from several academic and research units in the College of Liberal Arts and Sciences and the College of Engineering and Applied Sciences: the Departments of Chemical and Materials Engineering, Chemistry and Biochemistry, Electrical Engineering, Mechanical and Aerospace Engineering, and Physics and Astronomy, and the Center for Solid State Science.

MATERIALS SCIENCE—M.S.

The M.S. degree in Materials Science is an interdisciplinary program of study that integrates courses offered by several academic departments and faculty representing various disciplines to provide a sound foundation for research leading to a thesis. Emphasis is placed upon application of the core fundamentals for investigation of the relationships between syntheses, microstructure, physical and chemical properties, and the performance of solids in current technological applications.

Admission. All applications for graduate study are processed by the ASU Graduate College. The Graduate College has an online application on the Web at www.asu.edu/graduate. Applicants must satisfy the general requirements for admission to the Graduate College, which include

1. application;
2. application fee of \$45;
3. official transcripts;
4. official TOEFL for international students (minimum of 600 for admission to the SEM Program); and
5. TSE for students who wish to be considered for a teaching assistantship.

Students must also satisfy the requirements of the program which are

1. GRE (verbal, quantitative and analytical);
2. resume;
3. statement of purpose; and
4. three letters of recommendation.

All application materials must be received by the program (postmarked) by February 15 for the fall semester and October 15 for the spring semester.

Program of Study. The master’s degree in Materials Science is structured around a comprehensive set of courses contained in the participating disciplines. Because of the multidisciplinary emphasis of the program, a balance is sought of courses that are taught with engineering and science objectives. The program consists of 33 semester hours beyond the bachelor’s degree. A minimum of 24 semester hours are split evenly between four core courses (12 semester hours) and four elective courses (12 semester hours). The remainder of semester hours are devoted to seminar (three semester hours), research (three semester hours), and thesis (three semester hours).

Interdisciplinary Course Hours

CHM 471 Solid-State Chemistry	3
CHM 541 Advanced Thermodynamics	3
or MSE 530 Materials Thermodynamics and Kinetics (3)	
PHY 481 Solid-State Physics.....	3
SEM 500 Introduction to Physical Materials	3
SEM 591 Graduate Seminar.....	3
Total	15

Foreign Language Requirements. None.

Thesis Requirements. The thesis, which is the final and most important product of the student’s effort in this program, must report original research in the field and demonstrate the student’s ability to conduct creative, independent research. Each candidate must register for three semester hours of research and three semester hours of thesis.

Final Examination. The final examination in defense of the thesis is conducted by the student’s thesis committee and other faculty members appointed by the dean of the Graduate College.

COURSES

For courses, see “Science and Engineering of Materials (SEM),” page 313.

Mathematics

Master’s and Doctoral Programs

math.la.asu.edu
480/965-3951
PS A216

Andrew Bremner, Chair

Regents’ Professor: Trotter

Professors: Armbruster, Bremner, Bustoz, Gardner, Hoppensteadt, Ihrig, Jackiewicz, Kadell, Kawski, Kierstead, Kostelich, Kuang, Kuiper, Lai, Leonard, Lohr, McDonald, Mittelmann, Nicolaenko, Quigg, Renaut, Ringhofer, H.A. Smith, H.I. Smith, Thieme, Young

Associate Professors: Baer, Barcelo, Blount, Carlson, Childress, Driscoll, Farmer, Gelb, Hurlburt, D. Jones, J. Jones, Kurtz, Lopez, Mahalov, McCarter, Moore, Nikitin, Prewitt, Spielberg, Suslov, Swimmer, Taylor, Wellfert

Assistant Professors: Czygrinow, Kaliszewski, Zandieh, Zuo

The faculty in the Department of Mathematics and Statistics offer graduate programs leading to the M.A. and Ph.D. degrees in Mathematics.

The faculty also participate in the program leading to the Master of Natural Science (M.N.S.) degree when one of the concentrations is mathematics. In collaboration with the College of Education, the Department of Mathematics and Statistics offers an option for the M.N.S. degree that leads to high school certification.

In addition, the faculty participate in the interdisciplinary program leading to the M.S. degree in Statistics (see “Statistics,” page 326).

It is required that students applying to one of these programs submit scores on the Graduate Record Examination.

Students in the College of Education admitted to the Master of Education (see “Master of Education,” page 181) or Doctor of Education (see “Doctor of Education,” page 182) degree program in Secondary Education may elect mathematics as the subject matter field. These programs are offered and administered through the College of Education.

MASTER OF ARTS

This degree is designed for students who wish to extend their knowledge of mathematics or prepare for certain careers related to mathematics. In order to be admitted without deficiencies, the student’s background should include

GRADUATE PROGRAMS AND COURSES

an undergraduate mathematics major or an equivalent preparation such as may be obtained in certain undergraduate programs in engineering or the sciences. In particular, it is required that the student's preparation include courses in linear algebra and foundations of analysis. A certain degree of familiarity with computer languages may also be required for some areas of study.

Students pursuing the M.A. degree in Mathematics may choose one of the following areas: general mathematics, applied mathematics, statistics and probability, and computational mathematics. Information concerning the requirements for each area may be obtained from the Department of Mathematics and Statistics.

See "Master's Degrees," page 93, for general requirements.

Program of Study. The program of study, including courses in mathematics and related subjects, is selected with the recommendation of the student's supervisory committee. Ordinarily, a program of study consists of a minimum of 30 semester hours.

Foreign Language Requirements. None.

Comprehensive Examinations. Written examinations are required. For details, contact the Department of Mathematics and Statistics.

Thesis Requirements. A thesis is required.

Final Examinations. A final oral examination in defense of the thesis is required.

MASTER OF NATURAL SCIENCE

The faculty of the Department of Mathematics and Statistics participate in programs leading to the M.N.S. degree (see "Natural Science," page 279). This degree is intended for the student who is interested in an interdisciplinary program with a major emphasis in mathematics and a minor emphasis in a related subject outside mathematics. The student's supervisory committee consists of two faculty members of the department and one faculty member of the department in the related area. The supervisory committee designs a program of study of at least 36 semester hours that is appropriate for the type of interdisciplinary work the student wishes to pursue. A special option of the M.N.S. degree leads to high school certification. The intention is to develop high school teachers with an excellent subject knowledge in mathematics. For more information, contact the Department of Mathematics and Statistics.

DOCTOR OF PHILOSOPHY

This Ph.D. is intended for the student with superior mathematical ability, emphasizing the development of creative scholarship and breadth and depth in background knowledge. Admission to the degree program is normally granted after completion of the master's degree. See "Doctoral Degrees," page 95, for general requirements.

Program of Study. The program of study is selected with the recommendation of the student's supervisory committee.

Qualifying Examinations. Qualifying examinations are required. They test a student's mastery of basic material in two of the following five areas: algebra, differential equations, mathematical statistics, numerical methods, and real analysis. Normally, students entering the graduate program with a bachelor's degree take these qualifying examinations at the beginning of the third semester, and those entering with a master's degree at the beginning of the second semester. These examinations are given once each semester.

Foreign Language Requirements. None.

Comprehensive Examinations. Written and oral comprehensive examinations are required.

Dissertation Requirements. A dissertation reporting significant, original research suitable for publication in a professional research journal is required. (See "Doctoral Dissertations," page 95.)

Final Examinations. A final oral examination in defense of the dissertation is required.

RESEARCH ACTIVITY

With 59 faculty members in the department, research interests cover most aspects of mathematics. In particular, the department has strengths in algebra, analysis, computational mathematics, control and system science, differential equations, discrete mathematics, dynamical systems and chaos, mathematical biology, mathematics education, number theory, and statistics.

MATHEMATICS (MAT)

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.

MAT 420 Scientific Computing. (3)

fall
Surveys and applies programming languages, libraries, and scientific visualization tools. Programming assignments emphasize software development skills. Lecture, lab. Fee. 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 nonlinear equations, interpolation, approximation, linear equations, float-

ing-point arithmetic, and roundoff error. Prerequisites: both MAT 271 (or its equivalent) and fluency in computer programming (preferably FORTRAN) or only instructor approval.

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: both MAT 342 and fluency in computer programming or only instructor approval.

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: both MAT 274 and fluency in computer programming or only instructor approval. MAT 371 recommended.

MAT 427 Computer Arithmetic. (3)

selected semesters

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.

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

Introduces 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.

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. Prerequisites: MAT 274, 342 (or 242); MAT 371 is recommended.

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. Prerequisites: MAT 274, 342 (or 242); MAT 371 recommended.

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 I. (3)

fall

Introduces analysis in metric spaces with emphasis on the real line. Appropriate as preparation for MAT 570. Prerequisites: MAT 300, 342.

MAT 473 Intermediate Real Analysis II. (3)

spring

Analysis in \mathbb{R}^n : implicit function theorem, introduction to manifolds, Lebesgue integration, change of variables formula, convergence theorems for integrals. Prerequisite: MAT 472 or instructor approval.

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)

selected semesters

MAT 485 History of Mathematics. (3)

selected semesters

Topics from the history of the origin and development of mathematical ideas. Prerequisite: MAT 272 (or its equivalent).

MAT 502 Neural Modeling. (3)

fall and spring

Mathematical modeling electrochemical processes in nerve. Cable theory, neuronal branching, spines, bifurcation analysis of excitable membrane models. Prerequisite: MAT 274.

MAT 503 Mathematical Cell Physiology. (3)

fall and spring

Mathematical modeling of dynamical aspects of cell physiology. Diffusion, membrane transport, intracellular calcium channel kinetics, calcium oscillations and waves. Lecture, computing lab.

MAT 504 Mathematical Aspects of Biotechnology. (3)

fall and spring

Bacterial growth, bacterial genetics, gene expression, stoichiometry of metabolic pathways, random walks, diffusion processes, biofilms. Prerequisite: instructor approval.

MAT 505 Perturbation Methods. (3)

selected semesters

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.

GRADUATE PROGRAMS AND COURSES

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)

selected semesters

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)

selected semesters

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.

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)

selected semesters

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)

selected semesters

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 recommended.

MAT 560 Dynamical Systems Methods in Fluid Dynamics. (3)

fall

Applies 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 562 Nonlinear Analysis of PDEs in Fluids. (3)

spring

Sobolev spaces; incompressible Euler and Navier-Stokes equations; weak and strong solutions; attractors and the connection with turbulence; geophysical applications. 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)

selected semesters

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)

selected semesters

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)

selected semesters

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)

selected semesters

Continuation of MAT 576. Prerequisite: MAT 576 or instructor approval.

MAT 578 Functional Analysis. (3)

selected semesters

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)

selected semesters

Continuation of MAT 578. Prerequisite: MAT 578 or instructor approval.

MAT 591 Seminar. (1–12)

selected semesters

Topics may include the following:

- 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)

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

MATHEMATICS EDUCATION (MTE)

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. Fee. Prerequisite: instructor approval.

MTE 483 Mathematics in the Secondary School. (3)

spring

Topics in geometry, number theory, algebra, and analysis. Emphasizes unifying principles. Prerequisite: MAT 310 or instructor approval.

MTE 585 Modern Geometry for Teachers. (3)

once a year

Euclidean, projective, and non-Euclidean geometries. Fee. Prerequisite: instructor approval.

MTE 587 Analysis for Teachers. (3)

selected semesters

Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: instructor approval.

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.

STATISTICS AND PROBABILITY (STP)

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).

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).

STP 525 Advanced Probability. (3)

selected semesters

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

Multinomial 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)

selected semesters

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)

selected semesters

Topics may include the following:

- Probability. (1–3)
- Statistics. (1–3)

STP 593 Applied Project. (1–12)

selected semesters

STP 599 Thesis. (1–12)

selected semesters

Omnibus Courses. For an explanation of courses offered but not specifically listed in this catalog, see "Omnibus Courses," page 48.