

**CURRICULUM CHECK SHEET**  
**Bachelor of Science in**  
**Computational Mathematical Sciences**  
**Arizona State University**  
**2005-2006**

**MAJOR REQUIREMENTS**

The degree in Computational Mathematical Science requires a minimum of 32 semester hours of coursework in Mathematics and Statistics, a minimum of 12 to 14 semester hours in science, and 9 semester hours in Computer Science, and a 3 hour advanced science course or internship/research credit for a minimum of 56 to 58 semester hours of coursework related to the major.

1. Core courses:

MAT 271, Calculus with Analytic Geometry II  
MAT 272, Calculus with Analytic Geometry III  
MAT 243, Discrete Mathematical Structures  
or MAT 300 Mathematical Structures

**Subtotal: 11 semester hours**

2. Core courses in Computational Mathematics:

MAT 275, Applied Differential Equations\*  
or MAT 274, Elementary Differential Equations  
MAT 343, Modern Linear Algebra\*  
or MAT 342, Linear Algebra  
MAT 420, Scientific Computing  
MAT 421, Applied Computational Methods  
\*(MAT 275 and 343 are recommended)

**Subtotal: 12 semester hours**

3. Three advanced courses in Mathematics and Statistics:

(a) Choose one course from group one:

MAT 362, Advanced Mathematics for Engineers and Scientists  
MAT 370, Intermediate Calculus  
MAT 371, Advanced Calculus I  
MAT 460, Vector Calculus

(b) Choose two courses from group two:

MAT 351, Mathematical Methods for Genetic Analysis  
MAT 415, Introduction to Combinatorics  
MAT 416, Introduction to Graph Theory  
MAT 419, Introduction to Linear Programming  
MAT 423, Numerical Analysis I  
MAT 425, Numerical Analysis II  
MAT 447, Cryptography  
MAT 451, Mathematical Modeling  
MAT 452, Introduction to Chaos and Nonlinear Dynamics  
MAT 455, Introduction to Fractals and Applications  
MAT 461, Applied Complex Analysis  
MAT 462, Applied Partial Differential Equations  
MAT 475, Differential Equations  
MAT 476, Partial Differential Equations  
STP 420, Introductory Applied Statistics  
STP 421, Probability  
STP 425, Stochastic Processes  
STP 427, Mathematical Statistics  
STP 429, Experimental Statistics

**Subtotal: 9 semester hours**

4. Computer Science requirement:

CSE 200, Concepts of Computer Science  
CSE 210, Object Oriented Design & Data Structures  
CSE 240, Introduction to Programming Languages  
or CSE 310, Data Structures & Algorithms

**Subtotal: 9 semester hours**

5. Science requirement:

Two one-year science and lab sequences from the following list:

**Astrophysics**

Astrophysics sequence:

AST 113 Astronomy Laboratory I  
AST 114 Astronomy Laboratory II  
AST 321, Introduction to Planetary and Stellar Astrophysics  
AST 322, Introduction to Galactic and Extragalactic Astrophysics

## **Biology**

Choose one from the following sequences:

- BIO 187 General Biology I  
and BIO 188, General Biology II;
- or BIO 188, General Biology II  
and BIO 193, The nature of Biological Science

## **Chemistry**

Choose one of the following sequences:

- CHM 113, General Chemistry  
and CHM 115 General Chemistry with Qualitative Analysis
- or CHM 113, General Chemistry  
and CHM 116 General Chemistry
- or CHM 115, General Chemistry with Qualitative Analysis  
and CHM 117 General Chemistry for Majors I
- or CHM 114 General Chemistry for Engineers  
and CHM 231 Elementary Organic Chemistry  
and CHM 235 Elementary Organic Chemistry Laboratory

## **Geology**

Geology Sequence:

- GLG 101, Introduction to Geology I (Physical)
- GLG 103, Introduction to Geology I Laboratory
- GLG 102, Introduction to Geology II
- GLG 104, Introduction to Geology II Laboratory

## **Microbiology and Molecular Biosciences/Biotechnology**

Choose one from the following sequences:

- MBB 245, Cellular and Molecular Biology  
and MBB 246 Cellular and Molecular Biology Laboratory
- or MIC 205, Microbiology  
and MIC 206 Microbiology Laboratory
- or MIC 206 Microbiology Laboratory  
and MIC 220, Biology of Microorganisms

## **Physics**

Choose one from the following sequence:

- PHY 121, Univ. Physics I: Mechanics  
and PHY 122, Univ. Physics I: Laboratory  
and PHY 131, Univ. Physics II: Electricity & Magnetism.  
and PHY 132, Univ. Physics II: Electricity & Magnetism Laboratory
- or PHY 150, Physics I  
and PHY 151, Physics II

### **Plant Biology**

Choose one from the following sequence:

- PLB 200, Biology of Plants  
and PLB 201, Biology of Plants Laboratory
- or MBB 245 Cellular and Molecular Biology  
and MBB 246 Cellular and Molecular Biology Laboratory

**Subtotal: 14-17 semester hours**

6. Internship, research, or Advanced Science Requirement. One of the following courses:

- a) MAT 484, Internship
- b) MAT 493, Honors Thesis/Research
- c) MAT 494, Independent Study/Research

One advanced course in science for which a one-year sequence in the same science is required.

**Subtotal: 3 semester hours**

Restrictions:

- 1. MAT 370 and MAT 371 may not both be counted toward major requirements in computational math sciences.
- 2. Credit may not be earned for both MAT 274 and MAT 275 or for both MAT 342 and 343.
- 3. A minimum grade of C is required in all coursework used to satisfy major requirements.