

APPLIED MATHEMATICAL SCIENCES - BS, BIOLOGICAL SCIENCE EMPHASIS

The curriculum in the Bachelor of Science in Applied Mathematical Sciences with a Biological Sciences emphasis explores the application of analytical problem solving tools to problems in biology, medicine, and the environment. Students in the Biological Sciences emphasis investigate techniques in applied and pure mathematics and pursue electives in biology and other sciences that demonstrate how mathematics models phenomena in the life sciences.

A student completing this program is prepared for a career in applications of mathematics to the life sciences. Furthermore, with the appropriate electives chosen, the student is prepared to enter quantitatively oriented graduate school or medical school, including Ph.D. programs in Applied Mathematics or Mathematics. A minor in biology is well suited to students in this program. All advising for this degree option is done through the Undergraduate Program Office in the Department of Mathematics.

Program Requirements

Biological Science Emphasis: Consult with departmental advisor.

First Year

Fall		Semester Credit Hours
BIOL 111	Introductory Biology I	4
ENGL 104 or ENGL 103	Composition and Rhetoric or Introduction to Rhetoric and Composition	3
MATH 171	Calculus I	4
Select one of the following:		4
CSCE 110	Programming I	
CSCE 111	Introduction to Computer Science Concepts and Programming	
CSCE 121	Introduction to Program Design and Concepts	
CSCE 206	Structured Programming in C	
Directed Studies ¹		1
Semester Credit Hours		16
Spring		
BIOL 112	Introductory Biology II	4
MATH 172	Calculus II	4
Select one of the following:		4
CHEM 119	Fundamentals of Chemistry I	
CHEM 107 & CHEM 117	General Chemistry for Engineering Students and General Chemistry for Engineering Students Laboratory	
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ²		3

Directed Studies ¹	1	
Semester Credit Hours		16

Second Year

Fall		
BIOL 213	Molecular Cell Biology	3
MATH 221	Several Variable Calculus	4
MATH 300	Foundations of Mathematics	3
STAT 211	Principles of Statistics I	3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ²		3
Directed Studies ¹		1
Semester Credit Hours		17

Spring

BIOL 214	Genes, Ecology and Evolution	3
CHEM 222 & CHEM 242	Elements of Organic and Biological Chemistry and Elementary Organic Chemistry Laboratory	4
MATH 308	Differential Equations	3
MATH 323	Linear Algebra	3
Directed Studies ¹		1
Semester Credit Hours		14

Third Year

Fall		
MATH 409	Advanced Calculus I	3
MATH 469	Introduction to Mathematical Biology	3
Directed Studies ¹		1
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ²		3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ²		3
MATH elective ³		3
Semester Credit Hours		16

Spring

MATH 417 or MATH 437	Numerical Methods or Principles of Numerical Analysis	4
MATH 442	Mathematical Modeling	3
STAT 212	Principles of Statistics II	3
Directed Studies ¹		1
MATH elective ³		3
Semester Credit Hours		14

Fourth Year

Fall		
MATH 410 or MATH 446	Advanced Calculus II or Principles of Analysis I	3
MATH 415 or MATH 433	Modern Algebra I or Applied Algebra	3
Select one of the following:		3
COMM 203	Public Speaking	
COMM 205	Communication for Technical Professions	
COMM 243	Argumentation and Debate	

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ²	3	satisfying a Core category, a college/department requirement, or a general elective can be used to satisfy this requirement. See academic advisor.
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ²	3	
Semester Credit Hours		15
Spring		
ECON 202 or ECON 203	Principles of Economics or Principles of Economics	3
MATH elective ³		6
General elective ⁴		3
Semester Credit Hours		12
Total Semester Credit Hours		120

¹ Select from MATH 285 or BIOL 285 (Quantative Biology Seminar). Consult Departmental advisor for selection of proper section.

² Of the 18 hours shown as University Core Curriculum (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>), 3 must be from language, philosophy and culture, 3 from creative arts, 6 from American history, 6 from Government/Political Science.

³ Select from MATH 325, MATH 407-499 (<http://catalog.tamu.edu/undergraduate/course-descriptions/math/>). One course must be a W or C course.

⁴ Select from any 100-499 course not used elsewhere, (except ALED 125; ASCC 102; ASTR 109/PHYS 109, ASTR 119/PHYS 119; BMEN 101; ISEN 101; KINE 199; LAND 101; MATH 102-148, MATH 151-166 (<http://catalog.tamu.edu/undergraduate/course-descriptions/math/>), MATH 304, MATH 309, MATH 311, MATH 365, MATH 366, MATH 367, MATH 375, MATH 376; PHYS 109/ASTR 109, PHYS 119/ASTR 119, PHYS 201, PHYS 202, PHYS 205; PSYC 301; STAT 201 STAT 301 - 303 (<http://catalog.tamu.edu/undergraduate/course-descriptions/stat/>); WFSC 101).

Maximum of 3 hours of MATH 300 or CSCE 222/ECEN 222 may be used in this degree program.

Maximum of 3 hours of MATH 411 or STAT 414 may be used in this degree program.

Maximum of 4 hours of MATH 417, MATH 437 or CSCE 442 may be used in this degree program.

If a grade of D or F is earned in any of the following courses, MATH 151/MATH 171, MATH 152/MATH 172, MATH 221/MATH 251/MATH 253, MATH 300, MATH 323 or MATH 308, this course must be immediately retaken and a grade of C or better earned. The department will allow at most two D's in upper-level (325-499) courses. If a third D is earned, one of the three courses in which a D was earned must be retaken and a grade of C or better earned.

Students desiring teacher certification should consult the requirements for certification before registering for electives.

Graduation requirements include a requirement for 3 hours of International and Cultural Diversity course (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>)s and 3 hours of Cultural Discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>) courses. A course