APPLIED MATHEMATICS - BS, MATH EMPHASIS

The curriculum in the Bachelor of Science in Applied Mathematics with a Mathematics emphasis explores the application of analytical problem-solving tools to concrete problems in technology and business. Students in the Mathematics emphasis investigate a broad array of techniques in applied and pure mathematics and pursue electives in related fields, such as computer science and statistics, that demonstrate how mathematics models challenges we face every day.

A student completing this program is prepared to enter employment with analytical and quantitative tools relevant to technological industries or modern financial markets. Furthermore, with the appropriate electives chosen, the student is prepared to enter quantitatively oriented graduate schools, including PhD programs in Applied Mathematics or Mathematics. All advising for this degree option is done through the Undergraduate Program Office in the Department of Mathematics.

Program Requirements

First Year
Fall
ENGL 104 or ENGL 103 Composition and Rhetoric or Introduction to Rhetoric and Composition 3
MATH 171 Calculus I 4
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3
Freshman Science elective 1 4
General elective 3,4 1
Semester Credit Hours 15
Spring
MATH 172 Calculus II 4
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3
Freshman Science elective 1 4
General elective 3,4 1
Semester Credit Hours 15
Second Year
Fall
MATH 221 Several Variable Calculus 4
MATH 300 Foundations of Mathematics 3
STAT 211 Principles of Statistics I 3
Select one of the following: 4
CSCE 110 Programming I
CSCE 111 Introduction to Computer Science Concepts and Programming
Semester Credit Hours 15

Third Year
Fall
MATH 409 Analysis on the Real Line 3
Select 3 hours from:
MATH 325 The Mathematics of Interest
MATH 407-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/math/)
Select 3 hours from:
CSCE 210-470 (http://catalog.tamu.edu/undergraduate/course-descriptions/csce/)
ISEN 320 Operations Research I
ISEN 340 Operations Research II
MATH 325 The Mathematics of Interest
MATH 407-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/math/)
STAT 335-482 (http://catalog.tamu.edu/undergraduate/course-descriptions/stat/)
PHYS 206 & PHYS 226 Newtonian Mechanics for Engineering and Science and Physics of Motion Laboratory for the Sciences 4
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3
Semester Credit Hours 16
Spring
MATH 410 or MATH 446 Multivariate Real Analysis or Analysis on Metric Spaces 3
MATH 415 or MATH 433 Modern Algebra I or Applied Algebra 3
Select one of the following: 4
OCNG 451 Mathematical Modeling of Ocean Climate
PHYS 207 & PHYS 227 Electricity and Magnetism for Engineering and Science and Electricity and Magnetsm Laboratory for the Sciences
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3
Semester Credit Hours 13
Fourth Year

Fall

Select two of the following:  

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>MATH 412</td>
<td>Theory of Partial Differential Equations</td>
</tr>
<tr>
<td>MATH 414</td>
<td>Fourier Series and Wavelets</td>
</tr>
<tr>
<td>MATH 424/STAT 424</td>
<td>Probability and Computing</td>
</tr>
<tr>
<td>MATH 442</td>
<td>Mathematical Modeling</td>
</tr>
<tr>
<td>MATH 469</td>
<td>Introduction to Mathematical Biology</td>
</tr>
<tr>
<td>MATH 470</td>
<td>Communications and Cryptography</td>
</tr>
<tr>
<td>MATH 471</td>
<td>Communications and Cryptography II</td>
</tr>
<tr>
<td>MATH 472</td>
<td>Elliptic Curve Cryptography</td>
</tr>
<tr>
<td>MATH 478</td>
<td>Topological Data Analysis</td>
</tr>
</tbody>
</table>

Select 3 hours from:

<table>
<thead>
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</tr>
</thead>
</table>
| CSCE 210-470 | http://catalog.tamu.edu/undergraduate/course-descriptions/cisce/ | 3
| ISEN 320 | Operations Research I                      |
| ISEN 340 | Operations Research II                     |
| MATH 325 | The Mathematics of Interest                |
| MATH 407-499 | http://catalog.tamu.edu/undergraduate/course-descriptions/math/ | 3
| STAT 335-482 | http://catalog.tamu.edu/undergraduate/course-descriptions/stat/ | 3

Select one of the following:  

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>COMM 203</td>
<td>Public Speaking</td>
</tr>
<tr>
<td>COMM 205</td>
<td>Communication for Technical Professions</td>
</tr>
<tr>
<td>COMM 243</td>
<td>Argumentation and Debate</td>
</tr>
</tbody>
</table>
| General Elective | http://catalog.tamu.edu/undergraduate/general-information/international-cultural-diversity-requirements/ | 4

Semester Credit Hours  16

Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 417</td>
<td>Numerical Methods</td>
</tr>
<tr>
<td>or MATH 437</td>
<td>Principles of Numerical Analysis</td>
</tr>
</tbody>
</table>

Select 3 hours from the following:  

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<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 325</td>
<td>The Mathematics of Interest</td>
</tr>
</tbody>
</table>
| MATH 407-499 | http://catalog.tamu.edu/undergraduate/course-descriptions/math/ | 3

University Core Curriculum | http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/ | 3

General Elective  4

Semester Credit Hours  16

Total Semester Credit Hours  120

1 Select 4 hours from: ASTR 111, BIOL 111, BIOL 112, CHEM 119, CHEM 120, CHEM 107/CHEM 117. The remaining 4 hours may be selected from: ASTR 111, ATMO 201/ATMO 202, BIOL 111, BIOL 112, CHEM 119, CHEM 120, CHEM 107/CHEM 117, GEO 101/GEO 102, OCN 251/OCNG 252.

2 Of the 18 hours shown as 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 MATH 170 is highly recommended for math majors co-enrolled in MATH 150, MATH 151, MATH 152, MATH 171 or MATH 172.

4 Select from any 100-499 course not used elsewhere, (except ALED 125, ASCC 102, ASTR 109/PHYS 109, ASTR 119/PHYS 119, BMEN 153, ISEN 101, KINE 199, LAND 101, MATH 102-148, MATH 151-168, MATH 304, MATH 309, MATH 311, MATH 365, MATH 366, MATH 367, MATH 375, MATH 376, PBSI 301, PHYS 201, PHYS 202, PHYS 205, STAT 201, STAT 301-303, http://catalog.tamu.edu/undergraduate/course-descriptions/stat/).

5 Except CSCE 222/ECEN 222, CSCE 285, CSCE 289, CSCE 291. 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/) and 3 hours of Cultural Discourse (http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/) courses. A course satisfying a Core category, a college/department requirement, or a general elective can be used to satisfy this requirement. See academic advisor.