APPLIED MATHEMATICAL SCIENCES - BS, MATH EMPHASIS

The curriculum in the Bachelor of Science in Applied Mathematical Sciences 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

<table>
<thead>
<tr>
<th>First Year</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>ENGL 104  or ENGL 103 Composition and Rhetoric or Introduction to Rhetoric and Composition</td>
<td>3</td>
</tr>
<tr>
<td>MATH 171 Calculus I</td>
<td>4</td>
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<tr>
<td>University Core Curriculum <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">(http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/)</a></td>
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<tr>
<td>Freshman Science elective</td>
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</tr>
<tr>
<td>General elective</td>
<td>3.4</td>
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<tr>
<td><strong>Semester Credit Hours</strong></td>
<td><strong>15</strong></td>
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<tr>
<td><strong>Spring</strong></td>
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</tr>
<tr>
<td>MATH 172 Calculus II</td>
<td>4</td>
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<tr>
<td>University Core Curriculum <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">(http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/)</a></td>
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<td><strong>Semester Credit Hours</strong></td>
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<table>
<thead>
<tr>
<th>Second Year</th>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>MATH 221 Several Variable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 300 Foundations of Mathematics</td>
<td>3</td>
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<tr>
<td>STAT 211 Principles of Statistics I</td>
<td>3</td>
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<td>Select one of the following:</td>
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<tr>
<td>CSCE 110 Programming I</td>
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<table>
<thead>
<tr>
<th>Third Year</th>
<th>Semester Credit Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
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</tr>
<tr>
<td>MATH 409 Advanced Calculus I</td>
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<tr>
<td>Select 3 hours from:</td>
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<tr>
<td>MATH 325 The Mathematics of Interest</td>
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<tr>
<td>MATH 407-499 <a href="http://catalog.tamu.edu/undergraduate/course-descriptions/math/">(http://catalog.tamu.edu/undergraduate/course-descriptions/math/)</a></td>
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<tr>
<td>Select 3 hours from:</td>
<td>3</td>
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<tr>
<td>CSCE 210-470 <a href="http://catalog.tamu.edu/undergraduate/course-descriptions/csce/">(http://catalog.tamu.edu/undergraduate/course-descriptions/csce/)</a></td>
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<tr>
<td>ISEN 320 Operations Research I</td>
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<tr>
<td>ISEN 340 Operations Research II</td>
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</tr>
<tr>
<td>MATH 325 The Mathematics of Interest</td>
<td></td>
</tr>
<tr>
<td>MATH 407-499 <a href="http://catalog.tamu.edu/undergraduate/course-descriptions/math/">(http://catalog.tamu.edu/undergraduate/course-descriptions/math/)</a></td>
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<tr>
<td>STAT 335-482 <a href="http://catalog.tamu.edu/undergraduate/course-descriptions/stat/">(http://catalog.tamu.edu/undergraduate/course-descriptions/stat/)</a></td>
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<tr>
<td>PHYS 206 &amp; PHYS 226 Newtonian Mechanics for Engineering and Science and Physics of Motion Laboratory for the Sciences</td>
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</tr>
<tr>
<td>University Core Curriculum <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">(http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/)</a></td>
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<tr>
<td><strong>Semester Credit Hours</strong></td>
<td><strong>16</strong></td>
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<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>MATH 410 Advanced Calculus II or MATH 446 Principles of Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 415 Modern Algebra I or MATH 433 Applied Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
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<tr>
<td>OCNG 451 Mathematical Modeling of Ocean Climate</td>
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</tbody>
</table>

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<tr>
<th>Program Requirements</th>
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</thead>
<tbody>
<tr>
<td>CSCE 111 Introduction to Computer Science Concepts and Programming</td>
<td></td>
</tr>
<tr>
<td>CSCE 121 Introduction to Program Design and Concepts</td>
<td></td>
</tr>
<tr>
<td>CSCE 206 Structured Programming in C</td>
<td></td>
</tr>
<tr>
<td>PHYS 207 &amp; PHYS 227</td>
<td>Electricity and Magnetism for Engineering and Science and Electricity and Magnetism Laboratory for the Sciences</td>
</tr>
<tr>
<td>University Core Curriculum (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a>)</td>
<td>3</td>
</tr>
</tbody>
</table>

| Semester Credit Hours | 13 |

**Fourth Year**

| Fall |  |
| Select one of the following: | 3 |
| MATH 412 | Theory of Partial Differential Equations |
| MATH 414 | Fourier Series and Wavelets |
| MATH 442 | Mathematical Modeling |
| MATH 469 | Introduction to Mathematical Biology |
| MATH 470 | Communications and Cryptography |
| MATH 471 | Communications and Cryptography II |
| MATH 472 | Elliptic Curve Cryptography |
| MATH 478 | Topological Data Analysis |
| Select 3 hours from the following: | 3 |
| MATH 325 | The Mathematics of Interest |
| MATH 407-499 | (http://catalog.tamu.edu/undergraduate/course-descriptions/math/) |
| Select 3 hours from: | 3 |
| 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/) |
| Select one of the following: | 3 |
| COMM 203 | Public Speaking |
| COMM 205 | Communication for Technical Professions |
| COMM 243 | Argumentation and Debate |
| General Elective | 3 |
| **Semester Credit Hours** | 15 |

| Spring |  |
| MATH 417 | Numerical Methods or MATH 437 | 4 |
| Select 3 hours from the following: | 3 |
| MATH 325 | The Mathematics of Interest |
| MATH 407-499 | (http://catalog.tamu.edu/undergraduate/course-descriptions/math/) |
| 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, GEOL 101/GEOL 102, OCNG 251/OCNG 252.
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. 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 (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 201, PHYS 202, PHYS 205, PSYC 301; STAT 201, STAT 301-303 (http://catalog.tamu.edu/undergraduate/course-descriptions/stat/); WFSCE 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 151 MATH 151 MATH 151 MATH 151 MATH 151 MATH 171, MATH 152 /MATH 172, MATH 221 /MATH 251 /MATH 253, MATH 300, MATH 323 MATH 323 MATH 323 MATH 323 MATH 323 MATH 323 MATH 328, 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 satisfying a Core category, a college/department requirement, or a general elective can be used to satisfy this requirement. See academic advisor.