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

First Year

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>ENGL 104 Composition and Rhetoric or ENGL 103 Introduction to Rhetoric and Composition 3</td>
</tr>
<tr>
<td>MATH 171 Calculus I or 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>) 2 4</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>) 2 3</td>
</tr>
<tr>
<td>Freshman Science elective 1 4</td>
</tr>
<tr>
<td>General elective 3,4 1</td>
</tr>
<tr>
<td>Semester Credit Hours 15</td>
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<tr>
<td>Spring</td>
</tr>
<tr>
<td>MATH 172 Calculus II 4</td>
</tr>
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<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>) 2 3</td>
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<tr>
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Second Year

<table>
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<tr>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>MATH 221 Several Variable Calculus 4</td>
</tr>
<tr>
<td>MATH 300 Foundations of Mathematics 3</td>
</tr>
<tr>
<td>STAT 211 Principles of Statistics I 3</td>
</tr>
<tr>
<td>Select one of the following:</td>
</tr>
<tr>
<td>CSCE 110 Programming I 4</td>
</tr>
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Spring

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ECON 202 Principles of Economics or ECON 203 Principles of Economics 3</td>
</tr>
<tr>
<td>MATH 308 Differential Equations 3</td>
</tr>
<tr>
<td>MATH 323 Linear Algebra 3</td>
</tr>
<tr>
<td>STAT 212 Principles of Statistics II 3</td>
</tr>
<tr>
<td>Select one of the following:</td>
</tr>
<tr>
<td>CSCE 110 Programming I 4</td>
</tr>
<tr>
<td>CSCE 111 Introduction to Computer Science Concepts and Programming</td>
</tr>
<tr>
<td>CSCE 121 Introduction to Program Design and Concepts</td>
</tr>
<tr>
<td>CSCE 206 Structured Programming in C</td>
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Third Year

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>MATH 409 Advanced Calculus I 3</td>
</tr>
<tr>
<td>Select 3 hours from:</td>
</tr>
<tr>
<td>MATH 325 The Mathematics of Interest 3</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>) 3</td>
</tr>
<tr>
<td>Select 3 hours from:</td>
</tr>
<tr>
<td>CSCE 210-470 (<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/csce/">http://catalog.tamu.edu/undergraduate/course-descriptions/csce/</a>) 5</td>
</tr>
<tr>
<td>ISEN 320 Operations Research I</td>
</tr>
<tr>
<td>ISEN 340 Operations Research II</td>
</tr>
<tr>
<td>MATH 325 The Mathematics of Interest</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>) 3</td>
</tr>
<tr>
<td>STAT 335-482 (<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/stat/">http://catalog.tamu.edu/undergraduate/course-descriptions/stat/</a>) 4</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 4</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>) 2 3</td>
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Spring

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<thead>
<tr>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>MATH 410 Advanced Calculus II or MATH 446 Principles of Analysis I 3</td>
</tr>
<tr>
<td>MATH 415 Modern Algebra I or MATH 433 Applied Algebra 3</td>
</tr>
<tr>
<td>Select one of the following:</td>
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<tr>
<td>OCNG 451 Mathematical Modeling of Ocean Climate 4</td>
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| CSCE 111 Introduction to Computer Science Concepts and Programming |
| CSCE 121 Introduction to Program Design and Concepts |
| CSCE 206 Structured Programming in C |

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<tbody>
<tr>
<td>Spring</td>
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<tr>
<td>ECON 202 Principles of Economics or ECON 203 Principles of Economics 3</td>
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<tr>
<td>MATH 308 Differential Equations 3</td>
</tr>
<tr>
<td>MATH 323 Linear Algebra 3</td>
</tr>
<tr>
<td>STAT 212 Principles of Statistics II 3</td>
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<tr>
<td>Select one of the following:</td>
</tr>
<tr>
<td>CSCE 110 Programming I 4</td>
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<th>Semester Credit Hours 16</th>
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<tbody>
<tr>
<td>Spring</td>
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<tr>
<td>ECON 202 Principles of Economics or ECON 203 Principles of Economics 3</td>
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<tr>
<td>MATH 308 Differential Equations 3</td>
</tr>
<tr>
<td>MATH 323 Linear Algebra 3</td>
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<td>STAT 212 Principles of Statistics II 3</td>
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<td>CSCE 206 Structured Programming in C</td>
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<p>| Semester Credit Hours 18 |</p>
<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>PHYS 207 &amp; PHYS 227</td>
<td>Electricity and Magnetism for Engineering and Electricity and Magnetism Laboratory for the Sciences</td>
<td>3</td>
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<tr>
<td>University Core Curriculum</td>
<td>(<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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### Fourth Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>MATH 412</td>
<td>Theory of Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 414</td>
<td>Fourier Series and Wavelets</td>
<td>3</td>
</tr>
<tr>
<td>MATH 442</td>
<td>Mathematical Modeling</td>
<td>3</td>
</tr>
<tr>
<td>MATH 469</td>
<td>Introduction to Mathematical Biology</td>
<td>3</td>
</tr>
<tr>
<td>MATH 470</td>
<td>Communications and Cryptography</td>
<td>3</td>
</tr>
<tr>
<td>MATH 471</td>
<td>Communications and Cryptography II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 472</td>
<td>Elliptic Curve Cryptography</td>
<td>3</td>
</tr>
<tr>
<td>MATH 478</td>
<td>Topological Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Select 3 hours from:</td>
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</tr>
<tr>
<td>MATH 325</td>
<td>The Mathematics of Interest</td>
<td>3</td>
</tr>
<tr>
<td>MATH 407-499</td>
<td>(<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/math/">http://catalog.tamu.edu/undergraduate/course-descriptions/math/</a>)</td>
<td>3</td>
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<tr>
<td>Select 3 hours from:</td>
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<td>3</td>
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<tr>
<td>CSCE 210-470</td>
<td>(<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/csce/">http://catalog.tamu.edu/undergraduate/course-descriptions/csce/</a>)</td>
<td>3</td>
</tr>
<tr>
<td>ISEN 320</td>
<td>Operations Research I</td>
<td>3</td>
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<tr>
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<tr>
<td>COMM 203</td>
<td>Public Speaking</td>
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<tr>
<td>COMM 205</td>
<td>Communication for Technical Professions</td>
<td>3</td>
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<tr>
<td>COMM 243</td>
<td>Argumentation and Debate</td>
<td>3</td>
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<tr>
<td>General Elective</td>
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#### Spring

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MATH 417 or MATH 437</td>
<td>Numerical Methods or Principles of Numerical Analysis</td>
<td>4</td>
</tr>
<tr>
<td>Select 3 hours from:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MATH 325</td>
<td>The Mathematics of Interest</td>
<td>3</td>
</tr>
<tr>
<td>MATH 407-499</td>
<td>(<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/math/">http://catalog.tamu.edu/undergraduate/course-descriptions/math/</a>)</td>
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<td>3</td>
</tr>
<tr>
<td>General Elective</td>
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### Total Semester Credit Hours

| Semester Credit Hours | 120 |