APPLIED MATHEMATICS, ENGINEERING, AND PHYSICS, B.S. AMEP

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS
All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatetext) section of the Guide.

General Education

• Breadth—Humanities/Literature/Arts: 6 credits
• Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
• Breadth—Social Studies: 3 credits
• Communication Part A & Part B *
• Ethnic Studies *
• Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF SCIENCE-APPLIED MATHEMATICS, ENGINEERING, AND PHYSICS (B.S.-AMEP)

Students pursuing a Bachelor of Science—Applied Mathematics, Engineering, and Physics degree in the College of Letters & Science must complete all of the requirements below. The B.S.—AMEP is a special degree program; it is not considered a major. The B.S.—AMEP degree is not available to students who intend to earn a degree outside the College of Letters & Science.

BACHELOR OF SCIENCE - AMEP DEGREE REQUIREMENTS

Mathematics
Complete the University General Education Requirements for Quantitative Reasoning A (QR-A) and Quantitative Reasoning B (QR-B) coursework.

Foreign Language
Complete the second unit of a foreign language.

Liberal Arts and Science Requirement
Complete a minimum of 20 credits in Liberal Arts and Science (LAS) coursework outside the physical and mathematical sciences, including:
• at least of 12 credits of Humanities and/or Social Science, including at least 6 credits in Humanities and at least 3 credits of Social Science
• a maximum of 8 credits of Biological Science
• additional eligible coursework to reach 20 total credits.

Courses that carry the Physical Science breadth designation, or are listed (or cross-listed) in the MATH or COMP SCI subjects, are not eligible.

Total Credits
Complete at least 125 credits.

UW–Madison Experience
Complete both:
• 30 credits in residence, overall, and
• 30 credits in residence after the 90th credit.

Quality of Work
• 2.000 in all coursework at UW–Madison

REQUIREMENTS FOR THE MAJOR
A total of at least 125 credits with a minimum GPA of 2.000 is required.

REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry 1</td>
<td>5</td>
</tr>
<tr>
<td>or MATH 275</td>
<td>Topics in Calculus I</td>
<td>4-5</td>
</tr>
<tr>
<td>MATH 222</td>
<td>Calculus and Analytic Geometry 2</td>
<td>4-5</td>
</tr>
<tr>
<td>or MATH 276</td>
<td>Topics in Calculus II</td>
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<tr>
<td>MATH 234</td>
<td>Calculus–Functions of Several Variables</td>
<td>4</td>
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</tbody>
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FOUNDATION: Physics (2.750 GPA)  13-14

First Introductory course

PHYSICS 201 General Physics
PHYSICS 207 General Physics
PHYSICS 247 A Modern Introduction to Physics
E M A 201 & E M A 202 Statics and Dynamics  1

Second Introductory course

PHYSICS 202 General Physics
PHYSICS 208 General Physics
PHYSICS 248 A Modern Introduction to Physics

Third Introductory course

PHYSICS 205 Modern Physics for Engineers
PHYSICS/ E C E 235 Introduction to Solid State Electronics
PHYSICS 241 Introduction to Modern Physics
PHYSICS 249 A Modern Introduction to Physics

CORE: Chemistry  5-9

CHEM 109 Advanced General Chemistry
CHEM 103 General Chemistry I
& CHEM 104 and General Chemistry II

CORE: Mathematics  18

MATH 321 Applied Mathematical Analysis
MATH 322 Applied Mathematical Analysis
**Additional CORE MATH electives from:**

- MATH 415 Applied Dynamical Systems, Chaos and Modeling
- MATH/STAT 431 Introduction to the Theory of Probability
- MATH/COMP SCI 513 Numerical Linear Algebra
- MATH/COMP SCI 514 Numerical Analysis
- MATH/I SYE/OTM/STAT 632 Introduction to Stochastic Processes

**CORE Physics**

- PHYSICS 311 Mechanics
- PHYSICS 322 Electromagnetic Fields

**Additional CORE PHYSICS electives from:**

- PHYSICS 321 Electric Circuits and Electronics
- PHYSICS 325 Optics
- PHYSICS 406 Special Topics in Physics
- PHYSICS 415 Thermal Physics
- PHYSICS 448 Atomic and Quantum Physics
- PHYSICS 449 Atomic and Quantum Physics

**CORE Engineering**

- 21 credits in Engineering courses approved by your AMEP Engineering advisor

**Laboratory Experience**

- E M A 522 Aerodynamics Lab
- PHYSICS 307 Intermediate Laboratory-Mechanics and Modern Physics
- PHYSICS 321 Electric Circuits and Electronics
- PHYSICS 407 Advanced Laboratory

**Computational Experience**

- COMP SCI 310 Problem Solving Using Computers
- COMP SCI 412 Introduction to Numerical Methods
- MATH/COMP SCI 513 Numerical Linear Algebra
- MATH/COMP SCI 514 Numerical Analysis

**Total Credits** 85-91

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### Footnotes

1. M E 240 Dynamics substitutes for E M A 202 Dynamics
2. MATH 319 & MATH 340 or MATH 375-MATH 376 may substitute for MATH 320
3. Laboratory experience credits may double-count in Physics and/or Engineering CORE
4. Computational experience credits may double-count in Mathematics CORE
5. The following course numbers are considered upper level in AMEP:
   - MATH 300–699
   - PHYSICS 311–699
   - E C E 310–699
   - E M A 405–699
   - I S Y E 313–699
   - M E 303–699

Courses meeting CORE, Lab, and Computation that are numbered 300–699

### University Degree Requirements

**Total Degree**

To receive a bachelor’s degree from UW—Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

**Residency**

Degree candidates are required to earn a minimum of 30 credits in residence at UW—Madison. “In residence” means on the UW—Madison campus with an undergraduate degree classification. “In residence” credit also includes UW—Madison courses offered in distance or online formats and credits earned in UW—Madison Study Abroad/Study Away programs.

**Quality of Work**

Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

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### Residence and Quality of Work

- Minimum 2.000 GPA in AMEP program courses
- Minimum 2.000 GPA and 15 upper-level AMEP program credits, taken in residence
- 15 credits in AMEP program courses, taken on the UW—Madison campus

### Honors in the Major

Honors in the Major is not available in Applied Mathematics, Engineering, and Physics.