MATHEMATICS: APPLIED MATHEMATICS, BS

Degree Requirements

Requirements for Students Matriculating in or before Academic Year 2021-2022. Learn more about University Academic Regulation 3.1 (http://catalog.okstate.edu/university-academic-regulations/#matriculation).

Minimum Overall Grade Point Average: 2.00
Total Hours: 120

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General Education Requirements

**English Composition**
See Academic Regulation 3.5 (http://catalog.okstate.edu/university-academic-regulations/#english-composition)

ENGL 1113 Composition I 3
or ENGL 1313 Critical Analysis and Writing I

Select one of the following:

ENGL 1213 Composition II 3
ENGL 1413 Critical Analysis and Writing II
ENGL 3323 Technical Writing

**American History & Government**

HIST 1103 Survey of American History 3
or HIST 1483 American History to 1865 (H)
or HIST 1493 American History Since 1865 (DH)
POLS 1113 American Government 3

**Analytical & Quantitative Thought (A)**

MATH 2144 Calculus I (A) 3
CS 1113 Computer Science I (A) 3

**Humanities (H)**

Courses designated (H) 6

**Natural Sciences (N)**

Must include one Laboratory Science (L) course

PHYS 2114 University Physics II (LN) 4

Courses designated (N) 2

**Social & Behavioral Sciences (S)**

ECON 2103 Introduction to Microeconomics (S) 3
or AGEC 1113 Introduction to Agricultural Economics (S)

**Additional General Education**

Courses designated (A), (H), (N), or (S) 7

**Diversity (D) & International Dimension (I)**

May be completed in any part of the degree plan

Select at least one Diversity (D) course
Select at least one International Dimension (I) course

**College/Departmental Requirements**

**First Year Seminar**

(Transfer students with 15 hours exempt) 1

**Arts & Humanities**

See note 2.a.

**Natural & Mathematical Sciences**

MATH 2153 Calculus II (A) 3
PHYS 2114 University Physics II (LN) 4

Select 2 additional hours. See note 2.b.

**Foreign Language**

See note 3

0-6 hours

**Upper-Division General Education**

Select 6 hours outside major department

See note 2.c.

**Hours Subtotal** 13

**Major Requirements**

Minimum GPA 2.00 with a minimum grade of "C" or "P" in each course in Major Requirements.

**Mathematics Core**

MATH 2163 Calculus III 3
MATH 2233 Differential Equations 3
MATH 3013 Linear Algebra (A) 3
MATH 3613 Introduction to Abstract Algebra 3
or MATH 4023 Introduction to Analysis

Select 3 hours of the following:

CS 1103 Computer Programming (A) 3
CS 2133 Computer Science II
CS 2433 C/C++ Programming
ENGR 1412 Introductory Engineering Computer Programming
STAT 4091 Sas Programming
STAT 4191 R Programming
STAT 4193 SAS and R Programming

Select 3 hours from the following, with at least 3 hours of MATH from each group:

STAT 4013 Statistical Methods I (A) 3
STAT 4033 Engineering Statistics
STAT 4053 Statistical Methods I for the Social Sciences (A)
MATH 3583 Introduction to Mathematical Modeling 3
MATH 4513 Numerical Analysis 3
or MATH 4553 Introduction to Optimization
MATH 4233 Intermediate Differential Equations 3
or MATH 4263 Introduction to Partial Differential Equations

Select 9 hours from the following, with at least 3 hours of MATH

**Analysis:**

MATH 4013 Calculus of Several Variables
MATH 4023 Introduction to Analysis
MATH 4083 Intermediate Analysis
MATH 4143 Advanced Calculus I
MATH 4263 Introduction to Partial Differential Equations
MATH 4283 Complex Variables
MATH 4343 Introduction to Topology
MATH 4423 Geometry and Algorithms in Three-Dimensional Modeling
MATH 5213 Fourier Analysis and Wavelets
STAT 4203  Mathematical Statistics I

Applied Algebra/Discrete Math:
MATH 4063  Advanced Linear Algebra
MATH 4453  Mathematical Interest Theory
MATH 4553  Introduction to Optimization
MATH 4663  Combinatorics
MATH 4713  Number Theory
MATH 4753  Introduction to Cryptography
MATH 4813  Groups and Representations
CS 3653  Discrete Mathematics for Computer Science

Select 3 hours of 4000-level courses in MATH or STAT or upper division CS 3

Areas of Application
Select 9 hours from one Area of Application (p. 2) 2 9

Capstone
Select 3 hours from a project or internship applying mathematical methods to a problem in the area of application: 3
MATH 4973  Senior Project
MATH 4993  Senior Honors Thesis
MATH 4590  Professional Practice in Mathematics (with approval of instructor and internship mentor)

Hours Subtotal 51

Electives
Select 15 hours 15
May need to include 6 hours of a foreign language (see note 3)
May need to include 6 hours upper-division general education outside major department (see note 2.c.) and 1 additional upper division hour
MATH 1513 and MATH 1813 required for students who do not place directly into MATH 2144.

Hours Subtotal 15

Total Hours 120

1  College and Departmental Requirements that may be used to meet General Education Requirements.
2  An alternative 9 hour plan with at least 6 upper division hours may be used with Departmental approval.
3  If Bioinformatics is selected, additional required courses BIOL 1114, CHEM 1314, and MICR 2132 may be used to meet Additional General Education, Natural and Mathematical Sciences, or Elective requirements.

Area of Application

Agricultural Economics

Code  Title  Hours
AGEC 3213  Quantitative Methods in Agricultural Economics 3
AGEC 3333  Agricultural Marketing and Price Analysis 3
AGEC 4213  Advanced Quantitative Methods in Agricultural Economics 3
or AGEC 4333  Commodity Futures Markets

Bioinformatics

Code  Title  Hours
MICR 2123  Introduction to Microbiology 3 3
MICR 3033  Cell and Molecular Biology 3
MICR 4203  Bioinformatics 3

Cognitive Sciences

Code  Title  Hours
CS 4793  Artificial Intelligence I 3
Select one of the following: 3
PHIL 4003  Mathematical Logic and Computability
PHIL 4313  Philosophy of Mind (H)
PHIL 4543  Philosophy of Language
PSYC 3173  Introduction to Cognitive Science (N) 3

Data Science

Code  Title  Hours
MSIS 2103  Business Data Science Technologies 3
MSIS 3223  Principles of Data Analytics 3
MSIS 3103  End User Database Systems Design and Management 3
or MSIS 3333  Database Systems Development

Economics

Code  Title  Hours
ECON 2203  Introduction to Macroeconomics 3
ECON 3113  Intermediate Microeconomics 3
or ECON 3123  Intermediate Macroeconomics 3
Select 3 hours of upper division ECON 3

Energy Finance

Code  Title  Hours
ACCT 2003  Survey of Accounting 3
FIN 3113  Finance 3
Select 3 hours from the following: 3
FIN 4003  Introduction to Energy Business
FIN 4363  Energy Finance

Finance

Code  Title  Hours
ACCT 2003  Survey of Accounting 3
FIN 3113  Finance 3
Select 3 hours from the following: 3
FIN 4223  Investments
FIN 4333  Financial Management
FIN 4763  Financial Futures and Options Markets
FIN 4843  Risk Management

Geographic Information Science

Code  Title  Hours
GEOG 4203  Fundamentals of Geographic Information Systems 3
GEOG 4343 Geographic Information Systems: Resource Management Applications 3
or GEOG 4353 Geographic Information Systems: Socioeconomic Applications

Select 3 hours of the following: 3

GEOG 3333 Spatial Analysis (A)
GEOG 4333 Remote Sensing
GEOL 4383 Introduction to GIS Programming

Operations Research

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEM 3103</td>
<td>Probability and Statistics for Engineers I</td>
<td>3</td>
</tr>
<tr>
<td>IEM 3703</td>
<td>Probability and Statistics for Engineers II</td>
<td>3</td>
</tr>
<tr>
<td>IEM 4013</td>
<td>Operations Research</td>
<td>3</td>
</tr>
</tbody>
</table>

Physics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 2203</td>
<td>University Physics III</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 6 hours of upper-division PHYS

Other Requirements

- See the College of Arts and Sciences Requirements.
- Minimum grade of "C" or "P" in all required MATH courses.
- Upper-Division Credit: Total hours must include at least 40 hours in courses numbered 3000 or above.
- Hours in One Department: For B.A. and B.S. degrees, no more than 54 hours in one department may be applied to degree requirements.

5. Teacher Certification

- Courses used to satisfy the General Education English Composition, U.S. History, American Government, and Mathematics or Statistics requirements will not count toward the 54-hour maximum allowed from one department.
- Courses with ATHL or LEIS prefixes and leisure activity courses may not be used for degree credit.
Students can satisfy the requirements for secondary schools teaching certification while earning a B.A. or B.S. in the College of Arts & Sciences. Those interested should see their Arts and Sciences advisor and the OSU Professional Education Unit in room 325 Willard.

**Additional State/OSU Requirements**

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.

- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.

- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.

- Degrees that follow this plan must be completed by the end of Summer 2027.