

# MATHEMATICS: ACTUARIAL SCIENCE AND FINANCIAL MATHEMATICS, BS

## Degree Requirements

**Requirements for Students Matriculating in or before Academic Year 2025-2026.** Learn more about University Academic Regulation 3.1 (<http://catalog.okstate.edu/university-academic-regulations/#matriculation>).

**Minimum Overall Grade Point Average: 2.50**

**Total Hours: 120**

| Code                                                                                                                                                                                                                                                                         | Title                                             | Hours |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|
| <b>General Education Requirements</b>                                                                                                                                                                                                                                        |                                                   |       |
| <i>English Composition</i>                                                                                                                                                                                                                                                   |                                                   |       |
| See Academic Regulation 3.5 ( <a href="http://catalog.okstate.edu/university-academic-regulations/#english-composition">http://catalog.okstate.edu/university-academic-regulations/#english-composition</a> )                                                                |                                                   |       |
| ENGL 1113                                                                                                                                                                                                                                                                    | Composition I                                     | 3     |
| or ENGL 1313                                                                                                                                                                                                                                                                 | Critical Analysis and Writing I                   |       |
| Select one of the following:                                                                                                                                                                                                                                                 |                                                   | 3     |
| ENGL 1213                                                                                                                                                                                                                                                                    | Composition II                                    |       |
| ENGL 1413                                                                                                                                                                                                                                                                    | Critical Analysis and Writing II                  |       |
| ENGL 3323                                                                                                                                                                                                                                                                    | Technical Writing                                 |       |
| <i>American History &amp; Government</i>                                                                                                                                                                                                                                     |                                                   |       |
| 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     |
| <i>Quantitative Thought &amp; Logical Reasoning (Q)</i>                                                                                                                                                                                                                      |                                                   |       |
| MATH 2144                                                                                                                                                                                                                                                                    | Calculus I (Q) <sup>1</sup>                       | 4     |
| CS 1103                                                                                                                                                                                                                                                                      | Computer Programming (Q) <sup>1</sup>             | 3     |
| or CS 1113                                                                                                                                                                                                                                                                   | Computer Science I (Q)                            |       |
| <i>Understanding Humanities-Human Heritage &amp; Cultures (H)</i>                                                                                                                                                                                                            |                                                   |       |
| Courses designated (H)                                                                                                                                                                                                                                                       |                                                   | 6     |
| <i>Reasoning in the Natural Sciences (N)</i>                                                                                                                                                                                                                                 |                                                   |       |
| Must include one Laboratory-Based Inquiry (L) course                                                                                                                                                                                                                         |                                                   |       |
| PHYS 1114                                                                                                                                                                                                                                                                    | College Physics I (LN) <sup>1</sup>               | 4     |
| or PHYS 2014                                                                                                                                                                                                                                                                 | University Physics I (LN)                         |       |
| Course designated (N)                                                                                                                                                                                                                                                        |                                                   | 2     |
| <i>Exploring Society &amp; Human Behavior (S)</i>                                                                                                                                                                                                                            |                                                   |       |
| ECON 2103                                                                                                                                                                                                                                                                    | Introduction to Microeconomics (S) <sup>1,2</sup> | 3     |
| <i>Diversity (D)</i>                                                                                                                                                                                                                                                         |                                                   |       |
| Courses designated (D)                                                                                                                                                                                                                                                       |                                                   | 3     |
| <i>Global Cultural Competency (G)</i>                                                                                                                                                                                                                                        |                                                   |       |
| Courses designated (G)                                                                                                                                                                                                                                                       |                                                   | 3     |
| <i>Additional General Education</i>                                                                                                                                                                                                                                          |                                                   |       |
| Additional general education credit hours may be required to meet the total 40-hour minimum of general education credit if courses carry more than one general education designation and can be used to meet multiple general education designation hour requirements above. |                                                   |       |

|                                                                                        |                                                                  |           |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------|
| Courses designated (Q), (H), (N), (S), (D), (G), or (F).                               |                                                                  | 0         |
| <b>Hours Subtotal</b>                                                                  |                                                                  | <b>40</b> |
| <b>College/Departmental Requirements</b>                                               |                                                                  |           |
| UNIV 1111                                                                              | First Year Seminar (or other approved first-year seminar course) | 1         |
| <i>Arts &amp; Humanities</i>                                                           |                                                                  |           |
| See note 2.a.                                                                          |                                                                  | 3         |
| <i>Natural &amp; Mathematical Sciences</i>                                             |                                                                  |           |
| MATH 2153                                                                              | Calculus II (Q)                                                  | 3         |
| MATH 2163                                                                              | Calculus III                                                     | 3         |
| MATH 2233                                                                              | Differential Equations                                           | 3         |
| <i>Foreign Language</i>                                                                |                                                                  |           |
| See note 3                                                                             |                                                                  |           |
| 0-6 hours                                                                              |                                                                  |           |
| <i>Upper-Division General Education</i>                                                |                                                                  |           |
| Select 6 hours outside major department                                                |                                                                  |           |
| See note 2.c.                                                                          |                                                                  |           |
| <b>Hours Subtotal</b>                                                                  |                                                                  | <b>13</b> |
| <b>Major Requirements</b>                                                              |                                                                  |           |
| Minimum GPA 2.50 and minimum grade of "C" or "P" in each course in Major Requirements. |                                                                  |           |
| <i>Mathematics Core (30 hours)</i>                                                     |                                                                  |           |
| MATH 3013                                                                              | Linear Algebra (Q)                                               | 3         |
| MATH 3613                                                                              | Introduction to Abstract Algebra                                 | 3         |
| MATH 3583                                                                              | Introduction to Mathematical Modeling                            | 3         |
| MATH 4453                                                                              | Mathematical Interest Theory                                     | 3         |
| STAT 4013                                                                              | Statistical Methods I (Q)                                        | 3         |
| or STAT 4053                                                                           | Statistical Methods I for the Social Sciences (Q)                |           |
| STAT 4203                                                                              | Mathematical Statistics I                                        | 3         |
| or STAT 4123                                                                           | Probability Theory                                               |           |
| Select 9 hours of the following:                                                       |                                                                  | 9         |
| MATH 4013                                                                              | Calculus of Several Variables                                    |           |
| MATH 4023                                                                              | Introduction to Analysis                                         |           |
| MATH 4083                                                                              | Intermediate Analysis                                            |           |
| MATH 4233                                                                              | Intermediate Differential Equations                              |           |
| MATH 4263                                                                              | Introduction to Partial Differential Equations                   |           |
| MATH 4513                                                                              | Introduction to Numerical Analysis                               |           |
| MATH 4553                                                                              | Introduction to Optimization                                     |           |
| MATH 4573                                                                              | Introduction to Mathematical Epidemiology                        |           |
| MATH 4663                                                                              | Combinatorics                                                    |           |
| MATH 4753                                                                              | Introduction to Cryptography                                     |           |
| MATH 5473                                                                              | Financial Calculus                                               |           |
| STAT 4213                                                                              | Mathematical Statistics II <sup>2</sup>                          |           |
| Select 3 hours of the following:                                                       |                                                                  | 3         |
| ECON 4213                                                                              | Econometric Methods                                              |           |
| ECON 4223                                                                              | Business and Economic Forecasting                                |           |
| STAT 4043                                                                              | Applied Regression Analysis                                      |           |
| <i>Professional Requirements (21 hours)</i>                                            |                                                                  |           |
| ACCT 2003                                                                              | Survey of Accounting <sup>2</sup>                                | 3         |
| ECON 2203                                                                              | Introduction to Macroeconomics <sup>2</sup>                      | 3         |
| FIN 3113                                                                               | Principles of Finance <sup>2</sup>                               | 3         |
| Select 3 hours of the following:                                                       |                                                                  | 3         |

|                                                                                                        |                                               |            |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------|
| FIN 4223                                                                                               | Investments                                   |            |
| FIN 4333                                                                                               | Financial Modeling                            |            |
| FIN 4763                                                                                               | Financial Futures and Options Markets         |            |
| FIN 4843                                                                                               | Risk Management                               |            |
| FIN 3613                                                                                               | General Insurance                             |            |
| Select 3 hours of the following:                                                                       |                                               | 3          |
| CS 1113                                                                                                | Computer Science I (Q)                        |            |
| ENGR 1412                                                                                              | Introductory Engineering Computer Programming |            |
| MSIS 3333                                                                                              | Database Systems Development                  |            |
| MSIS 4673                                                                                              | Data Visualization                            |            |
| STAT 4091                                                                                              | Sas Programming                               |            |
| STAT 4191                                                                                              | R Programming                                 |            |
| STAT 4193                                                                                              | SAS and R Programming                         |            |
| Select 6 hours of the following:                                                                       |                                               | 6          |
| 4000-level courses in MATH or STAT                                                                     |                                               |            |
| STAT 5053                                                                                              | Time Series Analysis                          |            |
| Upper-division courses in AGECE, ECON, or FIN                                                          |                                               |            |
| <b>Hours Subtotal</b>                                                                                  |                                               | <b>51</b>  |
| <b>Electives</b>                                                                                       |                                               |            |
| Select 16 hours                                                                                        |                                               | 16         |
| 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.). |                                               |            |
| MATH 1513 and MATH 1813 required for students who do not place directly into MATH 2144.                |                                               |            |
| Recommended:                                                                                           |                                               |            |
| BCOM 3113                                                                                              | Written Communication                         |            |
| or BCOM 3223                                                                                           | Oral Communication                            |            |
| or SPCH 3723                                                                                           | Business and Professional Communication       |            |
| MKTG 3213                                                                                              | Marketing (S) <sup>3</sup>                    |            |
| MGMT 3013                                                                                              | Fundamentals of Management (S) <sup>3</sup>   |            |
| <b>Hours Subtotal</b>                                                                                  |                                               | <b>16</b>  |
| <b>Total Hours</b>                                                                                     |                                               | <b>120</b> |

1

College and Departmental Requirements that may be used to meet General Education requirements.

2

Minimum grade of B required for the Society of Actuaries' Validation by Educational Experience (VEE) certification.

3

These courses should be selected when including pre-MBA preparation.

## Other Requirements

- See the College of Arts and Sciences Requirements.
- Minimum grade of "C" or "P" in all MATH courses.
- **Upper-Division Credit:** Total hours must include at least 40 hours in courses numbered 3000 or above.

## College of Arts and Sciences Requirements

1. **Hours in One Department:** For B.A. and B.S. degrees, no more than 54 hours in one department may be required to meet degree requirements. 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 required from one department.
2. **A&S College/Departmental Requirements**
  - a. Arts and Humanities are defined as any course carrying an (H) designation or courses from AMST, ART, DANC, ENGL (except ENGL 3323 Technical Writing) HIST, MUSI, PHIL (except PHIL 1313 Logic and Critical Thinking (Q), PHIL 3003 Symbolic Logic (Q) and PHIL 4003 Mathematical Logic and Computability), REL, TH, and foreign languages.
  - b. Natural and Mathematical Sciences are defined as any course from the following prefixes: ASTR, BIOCE, BIOL, CHEM, CS (except CS 4883 Social Issues in Computing), GEOL, MATH, MICR, PBIO, PHYS, and STAT; or courses from other departments that carry an (A) or (N) general education designation.
  - c. Six upper-division hours are required from General Education or any CAS courses outside the student's major department (<http://catalog.okstate.edu/college-arts-sciences-major-departments/>). This requirement may be satisfied by courses also used to satisfy any part of a student's degree program (i.e., in General Education, College Departmental Requirements, Major Requirements or Electives).
  - d. Non-Western Studies Requirement for B.A. and B.F.A.; One course in Non-Western Studies (N.W.). This requirement may be satisfied by courses also used to satisfy any part of a student's degree program (i.e., in General Education, College Departmental Requirements, Major Requirements or Electives).
  - e. The College of Arts & Sciences requires a minimum 2.0 GPA in all major requirements and a minimum 2.0 GPA in all major-prefix courses applied to the degree.
3. **Foreign Language Proficiency**
  - a. The foreign language requirement for the B.A. may be satisfied by 9 hours college credit in the same language, which must include 3 hours at the 2000-level, or equivalent proficiency (e.g., passing an advanced standing examination; TOEFL exam; presenting a high school transcript which demonstrates the high school was primarily conducted in a language other than English; etc.). Computer Science courses may not be used to satisfy this requirement. Currently Arabic and Mvskoke are not offered at the 2000-level at OSU.
  - b. The foreign language requirement for the B.S., B.M. and B.F.A. may be satisfied by presenting a high school transcript which demonstrates two years of study of a single foreign language (passing grades at second-year level of study). It may also be satisfied by 6 hours college credit in the same language, which must include language courses 1713 and 1813, or equivalent proficiency (e.g., passing an advanced standing examination; TOEFL exam; presenting a high school transcript which demonstrates the high school was primarily conducted in a language other than English; etc.). Computer Science courses may not be used to satisfy this requirement.
  - c. In addition to a. and b., students pursuing teacher certification must meet novice-high foreign language proficiency by presenting a high school transcript which demonstrates two

years of study of a single foreign language with no grade below B. Or, students may complete 3 hours college credit in a single language with no grade below C (or pass an advanced standing examination, College Level Examination Program (CLEP) exam, or Oral Proficiency Interview developed by the American Council on the Teaching of Foreign Languages, equivalent to 3 hours of college credit.) Or, students may meet the requirement by transfer of documentation of meeting the foreign language competency from one of the teacher education programs in the State of Oklahoma approved by the Oklahoma State Regents for Higher Education.

4. **Exclusions.** Courses with ATHL or LEIS prefixes and leisure activity courses may not be used for degree credit.

## Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 and 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 2031.

## Example Plan of Study

### Finish in Four Plan of Study

The plan below is an **example** of how students can successfully complete degree requirements in four years. This suggested class schedule plan may be used as a guide and can be adjusted based on individual needs. Students are required to meet with an academic advisor prior to enrollment each semester to plan their class schedule, and students are ultimately responsible for completing all degree requirements.

| Course                    | Title                                                  | Hours     |
|---------------------------|--------------------------------------------------------|-----------|
| <b>Freshman</b>           |                                                        |           |
| <b>Fall</b>               |                                                        |           |
| UNIV 1111                 | First Year Seminar                                     | 1         |
| ENGL 1113<br>or ENGL 1313 | Composition I<br>or Critical Analysis and Writing I    | 3         |
| MATH 2144                 | Calculus I (Q)                                         | 4         |
| General Education courses |                                                        | 6         |
| <b>Hours</b>              |                                                        | <b>14</b> |
| <b>Spring</b>             |                                                        |           |
| ENGL 1213<br>or ENGL 1413 | Composition II<br>or Critical Analysis and Writing II  | 3         |
| MATH 2153                 | Calculus II (Q)                                        | 3         |
| General Education courses |                                                        | 9         |
| <b>Hours</b>              |                                                        | <b>15</b> |
| <b>Sophomore</b>          |                                                        |           |
| <b>Fall</b>               |                                                        |           |
| MATH 2163                 | Calculus III                                           | 3         |
| PHYS 1114<br>or PHYS 2014 | College Physics I (LN)<br>or University Physics I (LN) | 4         |
| STAT 4013                 | Statistical Methods I (Q)                              | 3         |
| ACCT 2003                 | Survey of Accounting                                   | 3         |

|                                      |                                                          |            |
|--------------------------------------|----------------------------------------------------------|------------|
| General Education courses            |                                                          | 3          |
| <b>Hours</b>                         |                                                          | <b>16</b>  |
| <b>Spring</b>                        |                                                          |            |
| MATH 2233                            | Differential Equations                                   | 3          |
| MATH 3013                            | Linear Algebra (Q)                                       | 3          |
| PHYS 1214<br>or PHYS 2114            | College Physics II (LN)<br>or University Physics II (LN) | 4          |
| ECON 2103                            | Introduction to Microeconomics (S)                       | 3          |
| College and Elective courses         |                                                          | 3          |
| <b>Hours</b>                         |                                                          | <b>16</b>  |
| <b>Junior</b>                        |                                                          |            |
| <b>Fall</b>                          |                                                          |            |
| MATH 3613                            | Introduction to Abstract Algebra                         | 3          |
| STAT 4203                            | Mathematical Statistics I                                | 3          |
| ECON 2203                            | Introduction to Macroeconomics                           | 3          |
| Major, College, and Elective courses |                                                          | 6          |
| <b>Hours</b>                         |                                                          | <b>15</b>  |
| <b>Spring</b>                        |                                                          |            |
| MATH 4023                            | Introduction to Analysis                                 | 3          |
| MATH 4453                            | Mathematical Interest Theory                             | 3          |
| FIN 3113                             | Principles of Finance                                    | 3          |
| Major, College, and Elective courses |                                                          | 6          |
| <b>Hours</b>                         |                                                          | <b>15</b>  |
| <b>Senior</b>                        |                                                          |            |
| <b>Fall</b>                          |                                                          |            |
| Major, College, and Elective courses |                                                          | 15         |
| <b>Hours</b>                         |                                                          | <b>15</b>  |
| <b>Spring</b>                        |                                                          |            |
| Major, College, and Elective courses |                                                          | 14         |
| <b>Hours</b>                         |                                                          | <b>14</b>  |
| <b>Total Hours</b>                   |                                                          | <b>120</b> |