# Mathematics: Pre-Medical Sciences, BS

## Degree Requirements

Requirements for Students Matriculating in or before Academic Year 2022-2023. Learn more about University Academic Regulation 3.1 ([http://catalog.okstate.edu/university-academic-regulations/#matriculation](http://catalog.okstate.edu/university-academic-regulations/#matriculation)).

Minimum Overall Grade Point Average: 2.50
Total Hours: 120

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1113</td>
<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 1313</td>
<td>Critical Analysis and Writing I</td>
<td></td>
</tr>
</tbody>
</table>

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)      |       |

### Analytical & Quantitative Thought (A)

| MATH 2144 | Calculus I (A)                             | 4     |
| or CS 1103 | Computer Programming (A)                  | 3     |
| or CS 1113 | Computer Science I (A)                    |       |

### Humanities (H)

Courses designated (H) 6

### Natural Sciences (N)

Must include one Laboratory Science (L) course

| BIOL 1113 | Introductory Biology (N)                  | 4     |
| or BIOL 1114 | Introductory Biology (LN)               |       |

| PHYS 1114 | College Physics I (LN)                    | 4     |
| or PHYS 2014 | University Physics I (LN)                |       |

| PHYS 1214 | College Physics II (LN)                   | 4     |
| or PHYS 2114 | University Physics II (LN)               |       |

### Social & Behavioral Sciences (S)

| PSYC 1113 | Introductory Psychology (S)               | 3     |

### 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

### Major Requirements

A minimum grade of “C” or “P” is required in each course.

#### Mathematics Core

| MATH 2153 | Calculus II (A)                            | 3     |
| MATH 2163 | Calculus III                               | 3     |
| MATH 2233 | Differential Equations                     | 3     |
| MATH 3013 | Linear Algebra (A)                         | 3     |
| MATH 3613 | Introduction to Abstract Algebra           | 3     |

Select 3 hours of the following:

| MATH 3583 | Introduction to Mathematical Modeling      | 3     |
| MATH 3933 | Research Methods                           | 3     |
| MATH 4423 | Geometry and Algorithms in Three-Dimensional Modeling | 3 |

Select 3 hours of the following:

| MATH 4023 | Introduction to Analysis                   | 3     |
| MATH 4263 | Introduction to Partial Differential Equations | 3 |
| MATH 4513 | Introduction to Numerical Analysis         | 3     |

Select 9 hours of the following:

| MATH 4013 | Calculus of Several Variables             | 3     |
| MATH 4023 | Introduction to Analysis                  | 3     |
| MATH 4063 | Advanced Linear Algebra                   | 3     |
| MATH 4083 | Intermediate Analysis                     | 3     |
| MATH 4143 | Advanced Calculus I                       | 3     |
| MATH 4153 | Advanced Calculus II                      | 3     |
| MATH 4233 | Intermediate Differential Equations       | 3     |
| MATH 4263 | Introduction to Partial Differential Equations | 3 |
| MATH 4283 | Complex Variables                         | 3     |
| MATH 4343 | Introduction to Topology                  | 3     |
| MATH 4403 | Geometry                                  | 3     |
| MATH 4423 | Geometry and Algorithms in Three-Dimensional Modeling | 3 |
| MATH 4453 | Mathematical Interest Theory              | 3     |
| MATH 4513 | Introduction to Numerical Analysis        | 3     |
| MATH 4553 | Introduction to Optimization              | 3     |
| MATH 4603 | Intermediate Abstract Algebra             | 3     |
| MATH 4613 | Abstract Algebra I                        | 3     |
| MATH 4623 | Abstract Algebra II                       | 3     |

(Transfer students with 15 hours exempt) 1

### Arts & Humanities

See note 2.a.

Recommend HIST 3913 or PHIL 3833

### Natural & Mathematical Sciences

| CHEM 1314 | Chemistry I (LN)                          | 4     |
| CHEM 1515 | Chemistry II (LN)                         | 5     |

### Foreign Language

See note 3 0

### Upper-Division General Education

Select 6 hours outside major department

See note 2.c.

### Hours Subtotal 13

### Notes:

2.a. Arts & Humanities: Students are required to complete one course in each of the following areas: English Composition (ENGL 1113 or ENGL 1313), American History & Government (HIST 1103 or HIST 1483 or HIST 1493), and a course in the Natural Sciences (N).

2.b. Diversity (D) & International Dimension (I): Students must complete at least one Diversity (D) course and one International Dimension (I) course.

3. Foreign Language: Students are required to complete a course in the foreign language at the 1000-2000 level, or to demonstrate proficiency in a foreign language through the placement test.

4. Upper-Division General Education: Students must select 6 hours outside the major department, including one course in the Humanities (H) and one course in the Social & Behavioral Sciences (S).
Mathematics: Pre-Medical Sciences, BS

MATH 4663 Combinatorics
MATH 4713 Number Theory
MATH 4753 Introduction to Cryptography
MATH 4813 Groups and Representations

Select 3 hours of the following: 3
STAT 4013 Statistical Methods I (A)
STAT 4033 Engineering Statistics
STAT 4053 Statistical Methods I for the Social Sciences (A)

Select 3 hours of 4000-level MATH or STAT 2 3

Select 3 hours of the following: 3
4000-level MATH or STAT
Upper-Division CS or PHYS
CHEM 3433 Physical Chemistry I
MICR 4203 Bioinformatics

Pre-Med Sciences
Biology:
BIOL 1604 Animal Biology 4

Physiology or Organic Chemistry:
Select 8 hours from the following: 8
BIOL 3204 Physiology
& BIOL 3214 and Human Anatomy
CHEM 3053 Organic Chemistry I
& CHEM 3153 and Organic Chemistry II
& CHEM 3112 and Organic Chemistry Laboratory

Select 6 hours from the following, with 3 hours upper-division: 6
BIOL 3653 Survey of Biochemistry
BIOL 3023 General Genetics
BIOL 3233 Human Reproduction
MICR 2123 Introduction to Microbiology
MICR 2132 Introduction to Microbiology Laboratory
MICR 3033 Cell and Molecular Biology
MICR 3223 Advanced Microbiology
MICR 3253 Immunology
PSYC 2583 Developmental Psychology (S)
PSYC 3443 Abnormal Psychology (S)

Hours Subtotal 57

Electives
Select 10 hours 10

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.

Strongly recommended:
SOC 1113 Introductory Sociology (S)

Additional requirements for professional school admission exist. View the Admission Requirement Sheets at http://preprofessional.okstate.edu

Hours Subtotal 10

Total Hours 120

---

1
College and Departmental Requirements that may be used to meet General Education Requirements.

2
STAT 4023 Statistical Methods II, STAT 4043 Applied Regression Analysis or STAT 4063 Statistical Methods II for the Social Sciences recommended.

Other Requirements
- See the College of Arts and Sciences Requirements.
- Minimum 2.50 GPA 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.

College of Arts and Sciences Requirements

1. General Education Requirements
No more than two courses (or eight hours) from the major department (http://catalog.okstate.edu/college-arts-sciences-major-departments/) may be used to meet General Education and College Departmental Requirements. The General Education required English Composition, required U.S. History, required American Government, one required MATH or STAT course, and required foreign language for B.A. degrees do not count against the two-course maximum.

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 (A), PHIL 3003 Symbolic Logic (A) 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, BIOL, CHEM, CS (except CS 4883 Social Issues in Computing), GEOG, MATH, MICR, PBIO, PHYS, and STAT; or courses from other departments that carry an (A) or (N) general education designation.
   c. The required six hours of upper-division General Education may not include courses from the student’s major department. 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 3-hour 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
   a. 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.
   
   b. 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 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 2028.