

MICROBIOLOGY/CELL AND MOLECULAR BIOLOGY: PRE-MEDICAL/PRE-DENTAL, 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: 2.00

Total Hours: 120

Code	Title	Hours
General Education Requirements		
<i>English Composition</i>		
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:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
<i>American History & 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 & Logical Reasoning (Q)</i>		
MATH 1813	Preparation for Calculus (Q) (or higher)	3
<i>Understanding Humanities-Human Heritage & 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) ¹	4
PHYS 1214	College Physics II (LN) ¹	4
<i>Exploring Society & Human Behavior (S)</i>		
Course designated (S)		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 (at least 2 hours) are required to meet the total 40-hour minimum. If courses carry more than one general education designation and can be used to meet multiple minimum general education designation hours above, more than 2 hours of additional general education will be required here to meet the 40-hour minimum.		
Courses designated (Q), (H), (N), (S), (D), (G), or (F).		2
Hours Subtotal		40

College/Departmental Requirements		
<i>First Year Seminar</i>		
UNIV 1111	First Year Seminar (or other approved first year seminar course)	1
<i>Arts & Humanities</i>		
See note 2.a.		3
<i>Natural & Mathematical Sciences</i>		
CHEM 1314 & CHEM 1515	Chemistry I (LN) and Chemistry II (LN)	9
<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.		
Hours Subtotal		13
Major Requirements ²		
A minimum grade of "C" in each upper-division course and MICR 2123 and MICR 2132		
Select from the following: ³		3
BIOC 3653	Survey of Biochemistry ³	
OR		
BIOC 3713 & BIOC 3813	Biochemistry I and Biochemistry II ³	
BIOL 1113 & BIOL 1111	Introductory Biology (N) and Introductory Biology Laboratory (LN)	4
or BIOL 1114	Introductory Biology (LN)	
BIOL 1604	Animal Biology	4
or PBIO 1404	Plant Biology (LN)	
or BIOL 3214	Human Anatomy	
BIOL 3023	General Genetics	3
or ANSI 3423	Animal Genetics	
BIOL 3204	Physiology	4
CHEM 3053	Organic Chemistry I	3
CHEM 3112	Organic Chemistry Laboratory	2
CHEM 3153	Organic Chemistry II	3
Select one of the following courses: ⁵		3
MATH 2144	Calculus I (Q) ⁵	
STAT 2013	Elementary Statistics (Q) ⁵	
STAT 3023	Statistical Reasoning for Medical Applications (Q) ⁵	
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
MICR 3033	Cell and Molecular Biology	3
MICR 3223	Advanced Microbiology	3
MICR 4001	Professional Transitions in Microbiology and Cell and Molecular Biology	1
or UNIV 3511	Health Profession School Preparation	
MICR 4012	Molecular Microbiology Laboratory I	2
or MICR 4990	Special Problems	
or CHEM 4990	Undergraduate Research in Chemistry	
MICR 4112	Molecular Microbiology Capstone	2
or MICR 4990	Special Problems	

or CHEM 4990	Undergraduate Research in Chemistry	
MICR 4233	Advanced Cell and Molecular Biology	3
Select 9 hours from the following:		9
MICR 3143	Medical Mycology ⁴	
MICR 3253	Immunology	
MICR 3553	Foundations of Cancer	
MICR 4123	Virology	
MICR 4023	Microbiomes in Human Health and the Environment	
MICR 4053	Pathogenic Microbiology	
MICR 4203	Bioinformatics	
MICR 4253	Concepts in Medical Genetics	
MICR 4423	Antibiotics and Antibiotic Resistance	
MICR 4543	Microbial Genomics and Bioinformatics	
MICR 4263	Microbial Genetics: from Genes to Genomes	
Hours Subtotal		57
Electives ^{2, 3}		
Select 10 hours ^{3,5}		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.)		
Additional requirements for professional school admission exist. View Admission Requirements Sheets at your chosen school and/or at http://prehealth.okstate.edu .		
Recommended courses:		
MICR 1211	First Year Microbiology Laboratory Experience	
PSYC 1113	Introductory Psychology (S)	
SOC 1113	Introductory Sociology (S)	
UNIV 2511	Introduction to Health Careers	
UNIV 2611	Health Portfolio and Self-Development	
Hours Subtotal		10
Total Hours		120

1

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

2

With approval from the advisor and department head, a maximum of 30 hours from an accredited doctoral health program may be substituted for major requirements.

3

If BIOC 3713 and BIOC 3813 are selected, then elective hours will be reduced by 3 hours.

4

Offered Infrequently.

5

If MATH 2144 is chosen, Elective hours will be decreased by 1.

Additional requirements for professional school admission may exist. View Admission Requirements Sheets at your chosen school and/or at prehealth.okstate.edu (<http://prehealth.okstate.edu>).

Other Requirements

- See the College of Arts and Sciences Requirements.
- **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. **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, BIOC, 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
Freshman		
Fall		
BIOL 1113 & BIOL 1111 or BIOL 1114	Introductory Biology (N) or Introductory Biology (LN)	4
MATH 1813	Preparation for Calculus (Q)	3
MICR 1211	First Year Microbiology Laboratory Experience	1
General Education courses		7
Hours		15
Spring		
MATH 2144 or STAT 2013	Calculus I (Q) or Elementary Statistics (Q)	4
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	5

CHEM 1314	Chemistry I (LN)	4
General Education courses		3
Hours		16
Sophomore		
Fall		
MICR 3033	Cell and Molecular Biology	3
CHEM 1515	Chemistry II (LN)	5
General Education courses		6
Hours		14
Spring		
MICR 4233	Advanced Cell and Molecular Biology (Spring only)	3
CHEM 3053	Organic Chemistry I	3
PHYS 1114	College Physics I (LN)	4
General Education and Elective courses		6
Hours		16
Junior		
Fall		
CHEM 3153	Organic Chemistry II	3
CHEM 3112	Organic Chemistry Laboratory	2
PHYS 1214	College Physics II (LN)	4
General Education and Elective courses		6
Hours		15
Spring		
BIOC 3653 or BIOC 3713	Survey of Biochemistry or Biochemistry I	3
BIOL 3204	Physiology	4
BIOL 3023 or ANSI 3423	General Genetics or Animal Genetics	3
MICR 4001 or UNIV 3511	Professional Transitions in Microbiology and Cell and Molecular Biology or Health Profession School Preparation	1
General Education and Elective courses		3
Hours		14
Senior		
Fall		
MICR 4012	Molecular Microbiology Laboratory I (Fall only)	2
MICR 3223	Advanced Microbiology	3
MICR 4253 or MICR 3143 or MICR 3553 or MICR 4023 or MICR 4053 or MICR 4123 or MICR 4203 or MICR 4263 or MICR 4423 or MICR 4543	Concepts in Medical Genetics ^{1,2} or Medical Mycology or Foundations of Cancer or Microbiomes in Human Health and the Environment or Pathogenic Microbiology or Virology or Bioinformatics or Microbial Genetics: from Genes to Genomes or Antibiotics and Antibiotic Resistance or Microbial Genomics and Bioinformatics	3
Major, College, and Elective courses or BIOL 3813		7
Hours		15
Spring		
MICR 4112	Molecular Microbiology Capstone (Spring only)	2
BIOL 1604 or BIOL 3214	Animal Biology or Human Anatomy	4
MICR 4263 or MICR 3143 or MICR 3553 or MICR 4023 or MICR 4053 or MICR 4123 or MICR 4203 or MICR 4253 or MICR 4423 or MICR 4543	Microbial Genetics: from Genes to Genomes ^{1,2} or Medical Mycology or Foundations of Cancer or Microbiomes in Human Health and the Environment or Pathogenic Microbiology or Virology or Bioinformatics or Concepts in Medical Genetics or Antibiotics and Antibiotic Resistance or Microbial Genomics and Bioinformatics	3

Major, General Education or Elective courses	6
Hours	15
Total Hours	120

1

The following courses are offered only in Fall semesters: MICR 3143 (of odd years), MICR 4023, MICR 4123, MICR 4203, MICR 4253, MICR 4423.

2

The following courses are offered only in Spring semesters: MICR 4053, MICR 4263, MICR 4543.