### REQUIREMENTS FOR THE BACHELOR OF SCIENCE

**COLLEGE OF ARTS AND SCIENCES**

**THE UNIVERSITY OF OKLAHOMA**

**Microbiology (Standard)** - Biotechnology

**B690 P061**

**Bachelor of Science**

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**Minimum Credit Hours and Grade Point Averages Required**

<table>
<thead>
<tr>
<th>Total Hours —</th>
<th>120</th>
</tr>
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<tbody>
<tr>
<td>Major Hours —</td>
<td>30</td>
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<tr>
<td>Grade Point Averages:</td>
<td>Overall &amp; Major: Combined OU/Transfer - 2.00 OU - 2.00</td>
</tr>
</tbody>
</table>

48 Upper-Division Hours REQUIRED

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**OU encourages students to complete at least 30 hours of applicable coursework each year to have the opportunity to graduate in four years.**

#### GENERAL EDUCATION AND COLLEGE REQUIREMENTS

Courses for fulfillment of General Education and College of Arts & Sciences requirements must be from the approved General Education course list published in the Class Schedule or at [http://www.ou.edu/enrollment/home](http://www.ou.edu/enrollment/home).

### University-Wide General Education (minimum 40 hours) and College of Arts and Sciences Requirements

**Core Area I: Symbolic and Oral Communication (9-22 hours, 3-6 courses)**

- **English Composition** (6 hours, 2 courses)
  1. English 1113, Principles of English Composition
  2. English 1213, Principles of English Composition, or EXPO 1213, Expository Writing

- **Foreign Language** (0-13 hours in the same language)
  The College of Arts and Sciences requirement cannot be met by high school coursework.

- **Mathematics** (3 hours, 1 course)

**Core Area II: Natural Science (7 hours, 2 courses) including one laboratory component.**

- 1. **Biological Science**
  Chosen from the following approved General Education designators: BIOL, HES, MBIO, or PBIO.

- 2. **Physical Science**
  Chosen from the following approved General Education designators: AGSC, ASTR, CHEM, GEOG, GEOL, GPHY, or PHYS.

**Core Area III: Social Science (6 hours, 2 courses)**

- 1. Political Science 1113, American Federal Government
- 2. __________________________

**Core Area IV: Humanities (18 hours, 6 courses)**

- a. **Understanding Artistic Forms** (3 hours, 1 course)
- b. **Western Civilization and Culture** (6 hours, 2 courses)
  1. History 1483, U.S., 1492-1865, or History 1493, U.S., 1865-Present,
  2. ________________________ (excluding HIST 1483 and 1493)
- c. **Non-Western Culture** (3 hours, 1 course):
- d. **Additional Core IV Humanities courses** (6 upper-division hours, 2 courses at the 3000-4000 level). Must be outside the major and selected from Understanding Artistic Forms, Western Civilization and Culture, or Non-Western Culture.
  - 1. ________________________
  - 2. ________________________

**Core Area V: Senior Capstone Experience** (3 hours, 1 course):

- College of Arts and Sciences Requirements: College requirements are not automatically fulfilled by a previous degree.

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**Some courses required for the major may also fulfill University General Education and/or College of Arts & Sciences Requirements**

**MAJOR REQUIREMENTS**

MBIO 2815 will not be accepted for major credit.

A total of 30 hours in microbiology is required, which must include the following.

**MICROBIOLOGY**

3113 Cell Biology
3673 Practical Bioinformatics
3812 Fund. of Microbiology Laboratory
3813 Fund. of Microbiology
4823 Pathogenic Microbiology and Infectious Disease
4843 Intro. to Molecular Biology
4853 Physiology of Microorganisms

One capstone course or two semesters of Senior Thesis:
4893 Capstone in Microbiology
or
4950 Senior Thesis - Capstone

**Laboratory Courses**

4313 Biotechnology Applications
4263 Cell Biology Laboratory

**CHEMISTRY**

1315 General Chemistry
1415 General Chemistry continued
3653 Organic Chemistry I: Biological
3152 Organic Chemistry Lab: Biological
3153 Organic Chemistry II: Biological
3653 Introduction to Biochemistry

**PHYSICS**

1311 General Physics Lab I
1321 General Physics Lab II
2414 General Physics for Life Science Oriented Majors
2424 General Physics for Life Science Oriented Majors

**MATH**

1743 Calculus I for Business, Life and Social Sciences

**PLANT BIOLOGY**

1114 General Botany

**BIOL**

1134 Introductory Biology: Evolution, Ecology, & Diversity

**HISTORY OF SCIENCE**

(also fulfills Gen. Ed. Western Civ.)

2423 Social & Ethical Issues in Science, Tech, Environment & Medicine
or
3333 Technology & Society in World History

**RECOMMENDED COURSES:**

A second course in Biochemistry is strongly recommended

**ECON** 1113, Principles of Econ. - Macro
**ECON** 1123, Principles of Econ. - Micro
**BAD** 2113, Intro. to Business I

**Free Electives**

Electives to bring total applicable hours to 120 including 48 upper-division hours.
**INFORMATION CONCERNING GENERAL RULES, REGULATIONS AND MINIMUM REQUIREMENTS**

**TOTAL CREDITS:** A minimum of 120 semester hours acceptable toward graduation must be completed.

**UPPER-DIVISION CREDITS:** A minimum of 48 upper-division semester hours acceptable toward graduation must be completed. OU courses numbered 3000 or above are upper-division. Transfer work is counted as lower-division or upper-division credit depending on the level at which it was offered at the institution where it was earned. Two-year college work is accepted only as lower-division credit.

**ARTS AND SCIENCES HOURS:** At least 80 semester hours of liberal arts and sciences courses are required for a BA degree. At least 55 semester hours of liberal arts and sciences courses are required for a BS degree.

**MAJOR WORK:** A minimum of 30 semester hours must be earned in the major, including a minimum of 15 credit hours at the upper-division level.

**PASS/NO PASS ENROLLMENT:** A maximum of 16 semester hours of free elective credit may be attempted under this option.

**INDIVIDUAL STUDIES (e.g., courses titled “Independent Study”):** A maximum of 12 total semester hours may be counted toward graduation, excluding Honors Reading and Honors Research.

**P.E. COURSES:** No physical education activity courses will be counted toward the 120 semester hours of acceptable credit for graduation.

**SENIOR INSTITUTION HOURS:** A minimum of 60 semester hours applied toward graduation must be earned at senior (4-year) institutions.

**RESIDENCY:**
- At least 15 of the final 30 hours applied toward the degree or at least 50 percent of the hours required by the institution in the major field must be satisfactorily completed at the awarding institution.
- At least 15 semester hours of upper-division major work must be completed in residence at OU.
- OU correspondence courses are not considered resident credit.
- Credits earned via examination are neither resident nor nonresident credit.

**GRADE POINT AVERAGES:** Students must earn a minimum overall 2.00 for each of the following: Combined Retention GPA (all college grades), OU Retention GPA, GPA for all major courses, and GPA for all major courses taken at OU. Some schools and departments of the College have higher minimum grade point averages required for their students.

**SPECIAL DEGREES:** Students may qualify for an Honors degree (cum Laude, Magna cum Laude, or Summa cum Laude) by completing specific requirements of the Honors College. A degree will be earned with Distinction if the student completes at least 60 semester hours at OU with at least a 3.60 combined retention GPA and OU retention GPA. A degree will be earned with Special Distinction if the student completes at least 60 semester hours at OU with at least a 3.90 combined retention GPA and OU retention GPA.

**APPLICATION FOR GRADUATION:** Students must apply for graduation during the term in which they complete their degree requirements in order to graduate in that term. The graduation application is available on line on your Ozone site. Deadlines for the OU Graduation Application are: March 1 for Spring certification and the University of Oklahoma Commencement book; July 1 for Summer graduation certification; and, October 1 for Fall graduation certification.

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Refer to the OU General Catalog for more complete information.

Suggested Semester Plan of Study — Microbiology (Standard) - Biotechnology - B690 P061

This plan shows one possible grouping of courses that would allow students to graduate in four years. Please refer to the front of the degree checksheet for official requirements. Students must consult with College of Arts and Sciences and/or Department of Microbiology and Plant Biology academic advisers to verify that courses selected each semester fulfill the recommended plan and satisfy university, College of Arts and Sciences, and Microbiology major requirements.

<table>
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<tr>
<th>Year</th>
<th>FIRST SEMESTER</th>
<th>Hours</th>
<th>SECOND SEMESTER</th>
<th>Hours</th>
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<td>FRESHMAN</td>
<td>CHEM 1315, General Chemistry</td>
<td>5</td>
<td>ENGL 1113, Principles of English Composition (Core I)</td>
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<td>MATH 1743, Calculus I for Business, Life and Social Sciences (Core I)</td>
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<td>Beginning Foreign Language (Core I)</td>
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<td>CHEM 1415, General Chemistry continued</td>
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<td>PS 1113, American Government (Core III)</td>
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<td>TOTAL CREDIT HOURS</td>
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<td>SOPHOMORE</td>
<td>CHEM 3053, Organic Chemistry I: Biological Emphasis</td>
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<td>PHYS 1311, General Physics Lab I</td>
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<td>PHYS 1311, General Physics Lab I</td>
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<td>PBIO 1114, General Botany</td>
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<td>PHYS 2414, General Physics for Life Sciences Oriented Majors</td>
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<td>CHEM 3153, General Chemistry II: Biological Emphasis</td>
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<td>Understanding Artistic Forms (Core IV)</td>
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<td>CHEM 3152, Organic Chemistry Lab: Biological</td>
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<td>Intermediate Foreign Language</td>
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<td>PHYS 2424, General Physics for Life Sciences Oriented Majors</td>
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<td>JUNIOR</td>
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<td>MBIO 3813, Fundamentals of Microbiology</td>
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<td>MBIO 3812, Fundamentals of Microbiology Laboratory</td>
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<td>MBIO 3113, Cell Biology</td>
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<td>MBIO 3673, Practical Bioinformatics</td>
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<td>Western Civilization &amp; Culture (Core IV)</td>
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<td>TOTAL CREDIT HOURS</td>
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<td>SENIOR</td>
<td>HIST 1483, United States 1492-1865, or 1493, United States 1865-Present (Core IV)</td>
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<td>MBIO 4853, Physiology of Microorganisms</td>
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<td>MBIO 4823, Pathogenic Microbiology and Infectious Disease</td>
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<td>MBIO 4893, Capstone in Microbiology (Capstone), or 4950, Senior Thesis-Capstone</td>
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<td>MBIO 4823, Pathogenic Microbiology and Infectious Disease</td>
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<td>MBIO 4313, Biotechnology Applications</td>
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<td>MBIO Major Elective</td>
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<td>Humanities, upper-division, outside major (Gen. Ed.)</td>
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<td>Free Elective, lower- or upper-division</td>
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<td>TOTAL CREDIT HOURS</td>
<td>14</td>
<td>TOTAL CREDIT HOURS</td>
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Bachelor’s degrees require a minimum of 48 hours of upper-division (3000-4000) coursework.

This plan of study should not be used in lieu of academic advisement.

Students who transfer from other institutions (particularly community colleges) must verify credit hour and course requirements with their college academic counselor, ELLH 124, 325-4411. http://ou.edu/cas.

Please make an appointment for a degree check with your college academic counselor once you have earned 90 hours. Appointments may be scheduled at https://iadviser.ou.edu/.