

**REQUIREMENTS FOR THE BACHELOR OF SCIENCE IN MICROBIOLOGY**  
**COLLEGE OF ARTS AND SCIENCES**  
 THE UNIVERSITY OF OKLAHOMA

For Students Entering the Oklahoma State System for Higher Education:  
**Summer 201** through **Spring 2018**

<b>Minimum Credit Hours and Grade Point Averages Required</b>			
Total Hours —	<b>120</b>	Upper-Division Within Total	<b>48</b>
Major Hours —	<b>35</b>		
<b>Grade Point Averages:</b>			
<b>Overall &amp; Major: Combined OU/Transfer - 2.00 OU - 2.00</b>			
<b>48 Upper-Division Hours REQUIRED</b>			

Microbiology  
(Professional)

**B691**  
 Bachelor of Science  
 in Microbiology

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 graded P/NP will not apply.	Some courses required for the major may also fulfill University General Education and/or College of Arts & Sciences 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 <a href="http://www.ou.edu/enrollment/home/">http://www.ou.edu/enrollment/home/</a>	MAJOR REQUIREMENTS		MAJOR SUPPORT REQUIREMENTS																																																																																																										
	A grade of C or better must be earned in each Microbiology course presented for major credit and in the required supporting courses.																																																																																																												
<p><b>University-Wide General Education (minimum 40 hours) and College of Arts and Sciences Requirements</b></p> <p><b>Core Area I: Symbolic and Oral Communication</b> (9-22 hours, 3-6 courses)</p> <p>a. <b>English Composition</b> (6 hours, 2 courses)</p> <ol style="list-style-type: none"> <li>1. English 1113, Principles of English Composition</li> <li>2. English 1213, Principles of English Composition, or EXPO 1213, Expository Writing</li> </ol> <p>b. <b>Foreign Language</b> (0-13 hours in the same language)                      The College of Arts and Sciences requirement <i>cannot be met by high school coursework</i>.</p> <ol style="list-style-type: none"> <li>1. Beginning Course (0-5 hours) _____</li> <li>2. Beginning Course, continued (0-5 hours) _____</li> </ol> <p>♦ 3. Intermediate Course (2000 level, 0-3 hours). _____                      One course at the intermediate level or demonstrated competency at that level.</p> <p>c. <b>Mathematics</b> (3 hours, 1 course). _____</p> <p><b>Core Area II: Natural Science</b> (7 hours, 2 courses) including one laboratory component.</p> <p>♦ 1. <b>Biological Science</b> _____                      Chosen from the following approved General Education designators: BIOL, HES, MBIO, or PBIO.</p> <p>♦ 2. <b>Physical Science</b> _____                      Chosen from the following approved General Education designators: AGSC, ASTR, CHEM, GEOG, GEOL, GPBY, METR, or PHYS.</p> <p><b>Core Area III: Social Science</b> (6 hours, 2 courses)</p> <ol style="list-style-type: none"> <li>1. Political Science 1113, American Federal Government</li> <li>2. _____</li> </ol> <p><b>Core Area IV: Humanities</b> (18 hours, 6 courses)</p> <p>a. <b>Understanding Artistic Forms</b> (3 hours, 1 course) _____</p> <p>b. <b>Western Civilization and Culture</b> (6 hours, 2 courses)</p> <ol style="list-style-type: none"> <li>1. History 1483, U.S., 1492-1865, or History 1493, U.S., 1865-Present,</li> <li>2. _____ (excluding HIST 1483 and 1493)</li> </ol> <p>c. <b>Non-Western Culture</b> (3 hours, 1 course): _____</p> <p>d. <b>Additional Core IV Humanities courses</b> (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.</p> <p>♦ 1. _____</p> <p>♦ 2. _____</p> <p><b>Core Area V: Senior Capstone Experience</b> (3 hours, 1 course): _____</p> <p>♦ College of Arts and Sciences Requirements: College requirements are not automatically fulfilled by a previous degree.</p>	<p><b>MBIO 2815 will not be accepted for major credit.</b></p> <p>A total of 35 hours in microbiology is required, which must include the following.</p> <p><b>MICROBIOLOGY</b></p> <table style="width: 100%;"> <tr> <td style="width: 60%;">3812 Fund. of Microbiology Laboratory</td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 30%;"></td> </tr> <tr> <td>3813 Fund. of Microbiology</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>4823 Pathogenic Microbiology and Infectious Disease</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td>4843 Intro. to Molecular Biology</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td>4853 Physiology of Microorganisms</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3">One capstone course or two semesters of Senior Thesis:</td> </tr> <tr> <td>4893 Capstone in Microbiology</td> <td style="text-align: center;">3-6</td> <td></td> </tr> <tr> <td>or</td> <td></td> <td></td> </tr> <tr> <td>4950 Senior Thesis - Capstone</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3"><b>Two of the following Laboratory Courses:</b></td> </tr> <tr> <td>4263 Cell Biology Laboratory</td> <td></td> <td></td> </tr> <tr> <td>4313 Biotechnology Applications</td> <td></td> <td></td> </tr> <tr> <td>4813 Ecology &amp; Pathogenic Microbiology Laboratory</td> <td></td> <td></td> </tr> <tr> <td>4873 Microbial Physiology &amp; Molecular Biology Laboratory</td> <td></td> <td></td> </tr> <tr> <td>4883 Water Microbiology Laboratory</td> <td></td> <td></td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3">MBIO electives to complete 35 hours required in the major:</td> </tr> <tr> <td>2123 Cornerstone Research Experience (recommended)</td> <td></td> <td></td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3">_____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>	3812 Fund. of Microbiology Laboratory	2		3813 Fund. of Microbiology	3					4823 Pathogenic Microbiology and Infectious Disease	3		4843 Intro. to Molecular Biology	3		4853 Physiology of Microorganisms	3					One capstone course or two semesters of Senior Thesis:			4893 Capstone in Microbiology	3-6		or			4950 Senior Thesis - Capstone	3					<b>Two of the following Laboratory Courses:</b>			4263 Cell Biology Laboratory			4313 Biotechnology Applications			4813 Ecology & Pathogenic Microbiology Laboratory			4873 Microbial Physiology & Molecular Biology Laboratory			4883 Water Microbiology Laboratory						_____			_____			_____			_____			_____						MBIO electives to complete 35 hours required in the major:			2123 Cornerstone Research Experience (recommended)						_____			_____			_____			_____			_____						_____			_____		
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 **CHEMISTRY**   |   |   |  | |---|---|--| | 1315 General Chemistry  | 5 |  | | 1415 General Chemistry (continued)  | 5 |  | |   |   |  | | 3053 Organic Chemistry I: Biological  | 3 |  | | 3152 Organic Chemistry Lab: Biological  | 2 |  | | 3153 Organic Chemistry II: Biological   | 3 |  | |   |   |  | | 3451 Basic Physical Chem. Lab, and  | 1 |  | | 3453 Basic Physical Chemistry   | 3 |  | |   |   |  | | 3653 Introduction to Biochemistry   | 3 |  | | 3753 Intro. to Biochemical Methods  | 3 |  | |   |   |  | | <b>PHYSICS</b>  |   |  | | 1311 General Physics Lab I  | 1 |  | | 1321 General Physics Lab II   | 1 |  | | 2414 General Physics for Life Sciences  | 4 |  | | 2424 General Physics for Life Sciences  | 4 |  | |   |   |  | | <b>MATH</b>   |   |  | | 1743 Calculus I for Business, Life and Social Sciences                              | 3 |  | |   |   |  | | A course in statistics from:  |   |  | | BIOL 2913 Intro to Quantitative Biology   |   |  | | ECON 2843 Elements of Statistics  |   |  | | PSY 2113 Research Methods I: Stats.   |   |  | | PSC/SOC 3123 Social Statistics  |   |  | |   |   |  | | _____   |   |  | | _____   |   |  | |   |   |  | | <b>PLANT BIOLOGY</b>  |   |  | | 1114 General Botany   |   |  | | <b>or</b>   |   |  | | <b>BIOLOGY</b>  |   |  | | 1134 Introductory Biology: Evolution, Ecology, & Diversity                          |   |  | |   |   |  | | _____   |   |  | |   |   |  | | A second course in Biochemistry is strongly recommended.                            |   |  | |   |   |  | | _____   |   |  | |   |   |  | | <b>Free Electives</b>   |   |  | | Electives to bring total applicable hours to 120 including 48 upper-division hours. |   |  | |   |   |  | |   |   |  | |   |   |  | |  |

## INFORMATION CONCERNING GENERAL RULES, REGULATIONS AND MINIMUM REQUIREMENTS

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

**UPPER-DIVISION HOURS:** 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.

**GRADEPOINT 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.

**Refer to the OU General Catalog for more complete information.**

### Suggested Semester Plan of Study — Microbiology (Professional) - B691 P458

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 checklist 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.

Year	FIRST SEMESTER	Hours	SECOND SEMESTER	Hours
<b>FRESHMAN</b>	CHEM 1315, General Chemistry ENGL 1113, Principles of English Composition (Core I) MATH 1743, Calculus I for Business, Life and Social Sciences (Core I) BIOL 1134, Intro. Biology: Evolution, Ecology and Diversity, <b>or</b> PBIO 1114, General Botany	5 3 3 4	CHEM 1415, General Chemistry continued ENGL 1213, Principles of English Composition (Core I), <b>or</b> EXPO 1213, Expository Writing (Core I) P SC 1113, American Federal Government (Core III) MBIO 2123, Cornerstone Research Experience	5 3 3 3
	<b>TOTAL CREDIT HOURS</b>	<b>15</b>	<b>TOTAL CREDIT HOURS</b>	<b>14</b>
<b>SOPHOMORE</b>	CHEM 3053, Organic Chemistry I: Biological Emphasis PHYS 1311, General Physics Lab I PHYS 2414, General Physics for Life Sciences Oriented Majors Beginning Foreign Language (Core I) Social Science (Core III)	3 1 4 5 3	HIST 1483, United States 1492-1865, <b>or</b> 1493, United States 1865-Present (Core IV) CHEM 3153, Organic Chemistry II: Biological Emphasis CHEM 3152, Organic Chemistry Lab: Biological PHYS 1321, General Physics Lab II PHYS 2424, General Physics for Life Sciences Oriented Majors Beginning Foreign Language continued (Core I)	3 2 3 2 1 4 5
	<b>TOTAL CREDIT HOURS</b>	<b>16</b>	<b>TOTAL CREDIT HOURS</b>	<b>18</b>
<b>JUNIOR</b>	CHEM 3653, Introduction to Biochemistry MBIO 3813, Fundamentals of Microbiology MBIO 3812, Fundamentals of Microbiology Laboratory ECON 2843, Elements of Statistics, <b>or</b> PSY 2113, Research Methods I: Stats., <b>or</b> P SC/SOC 3123, Social Statistics, <b>or</b> BIOL 2913, Intro to Quantitative Biology Non-Western Culture (Core IV) Intermediate Foreign Language	3 3 2 3 3 3	CHEM 3753, Introduction to Biochemical Methods MBIO 4843, Introduction to Molecular Biology MBIO Major Laboratory requirement MBIO Major Elective Western Civilization & Culture (Core IV)	3 3 3 3 3
	<b>TOTAL CREDIT HOURS</b>	<b>17</b>	<b>TOTAL CREDIT HOURS</b>	<b>15</b>
<b>SENIOR</b>	MBIO 4823, Pathogenic Microbiology and Infectious Disease MBIO Major Laboratory requirement MBIO Major Elective Humanities, upper-division, outside major (Gen. Ed.) Understanding Artistic Forms (Core IV)	3 3 3 3 3	CHEM 3451, Basic Physical Chemistry Lab CHEM 3453, Basic Physical Chemistry MBIO 4853, Physiology of Microorganisms MBIO 4893, Capstone in Microbiology (Capstone), <b>or</b> 4950, Senior Thesis-Capstone MBIO Major Elective Humanities, upper-division, outside major (Gen. Ed.)	1 3 3 3 3 3
	<b>TOTAL CREDIT HOURS</b>	<b>15</b>	<b>TOTAL CREDIT HOURS</b>	<b>16</b>

**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://iadvise.ou.edu/>.