

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

For Students Entering the Oklahoma State System for Higher Education:

Summer 2015 through Spring 2016

Minimum Credit Hours and Grade Point Averages Required			
Total Hours —	120	Upper-Division Within Total	48
Major Hours —	30	Upper-Division Within Major	30
Grade Point Averages:			
Overall & Major: Combined OU/Transfer - 2.00 OU - 2.00			
48 Upper-Division Hours REQUIRED			

Microbiology (Standard)-
Biotechnology

B690 P061
Bachelor of Science

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																																																																																																																																		
	MAJOR REQUIREMENTS	MAJOR SUPPORT REQUIREMENTS																																																																																																																																	
<p>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/</p> <p>University-Wide General Education (minimum 40 hours) and College of Arts and Sciences Requirements</p> <p>Core Area I: Symbolic and Oral Communication (9-22 hours, 3-6 courses)</p> <p>a. English Composition (6 hours, 2 courses)</p> <ol style="list-style-type: none"> 1. English 1113, Principles of English Composition 2. English 1213, Principles of English Composition, or EXPO 1213, Expository Writing <p>b. Foreign Language (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"> 1. Beginning Course (0-5 hours) _____ 2. Beginning Course, continued (0-5 hours) _____ <p>♦ 3. Intermediate Course (2000 level, 0-3 hours). _____ One course at the intermediate level or demonstrated competency at that level.</p> <p>c. Mathematics (3 hours, 1 course). _____</p> <p>Core Area II: Natural Science (7 hours, 2 courses) including one laboratory component.</p> <p>♦ 1. Biological Science _____ Chosen from the following approved General Education designators: BIOL, HES, MBIO, or PBIO.</p> <p>♦ 2. Physical Science _____ Chosen from the following approved General Education designators: AGSC, ASTR, CHEM, GEOG, GEOL, GPHY, METR, or PHYS.</p> <p>Core Area III: Social Science (6 hours, 2 courses)</p> <ol style="list-style-type: none"> 1. Political Science 1113, American Federal Government 2. _____ <p>Core Area IV: Humanities (18 hours, 6 courses)</p> <p>a. Understanding Artistic Forms (3 hours, 1 course) _____</p> <p>b. Western Civilization and Culture (6 hours, 2 courses)</p> <ol style="list-style-type: none"> 1. History 1483, U.S., 1492-1865, or History 1493, U.S., 1865-Present, 2. _____ (excluding HIST 1483 and 1493) <p>c. Non-Western Culture (3 hours, 1 course): _____</p> <p>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.</p> <p>♦ 1. _____</p> <p>♦ 2. _____</p> <p>Core Area V: Senior Capstone Experience (3 hours, 1 course): _____</p> <p>♦ College of Arts and Sciences Requirements: College requirements are not automatically fulfilled by a previous degree.</p>	<p>MBIO 2815 will not be accepted for major credit.</p> <p>A total of 30 hours in microbiology is required, which must include the following.</p> <p>MICROBIOLOGY</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">3113</td><td style="width: 85%;">Cell Biology</td><td style="width: 5%; text-align: center;">3</td><td style="width: 5%;"></td></tr> <tr><td>3673</td><td>Practical Bioinformatics</td><td style="text-align: center;">3</td><td></td></tr> <tr><td>3812</td><td>Fund. of Microbiology Laboratory</td><td style="text-align: center;">2</td><td></td></tr> <tr><td>3813</td><td>Fund. of Microbiology</td><td style="text-align: center;">3</td><td></td></tr> <tr><td>4823</td><td>Pathogenic Microbiology and Infectious Disease</td><td style="text-align: center;">3</td><td></td></tr> <tr><td>4843</td><td>Intro. to Molecular Biology</td><td style="text-align: center;">3</td><td></td></tr> <tr><td>4853</td><td>Physiology of Microorganisms</td><td style="text-align: center;">3</td><td></td></tr> </table> <p>One capstone course or two semesters of Senior Thesis:</p> <p>4893 Capstone in Microbiology or 4950 Senior Thesis - Capstone</p> <p>_____</p> <p>_____</p> <p>Laboratory Courses</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">4313</td><td style="width: 85%;">Biotechnology Applications</td><td style="width: 5%; text-align: center;">3</td><td style="width: 5%;"></td></tr> <tr><td>4810</td><td>Cell Biology Laboratory</td><td style="text-align: center;">3</td><td></td></tr> </table> <p>MBIO electives to complete 30 hours required in the major:</p> <p>_____</p>	3113	Cell Biology	3		3673	Practical Bioinformatics	3		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		4313	Biotechnology Applications	3		4810	Cell Biology Laboratory	3		<p>A grade of C or better must be earned in each Microbiology course presented for major credit and in the required supporting courses.</p> <p>CHEMISTRY</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">1315</td><td style="width: 85%;">General Chemistry</td><td style="width: 5%; text-align: center;">5</td><td style="width: 5%;"></td></tr> <tr><td>1415</td><td>General Chemistry continued</td><td style="text-align: center;">5</td><td></td></tr> <tr><td>3053</td><td>Organic Chemistry I: Biological</td><td style="text-align: center;">3</td><td></td></tr> <tr><td>3152</td><td>Organic Chemistry Lab: Biological</td><td style="text-align: center;">2</td><td></td></tr> <tr><td>3153</td><td>Organic Chemistry II: Biological</td><td style="text-align: center;">3</td><td></td></tr> <tr><td>3653</td><td>Introduction to Biochemistry</td><td style="text-align: center;">3</td><td></td></tr> </table> <p>PHYSICS</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">1311</td><td style="width: 85%;">General Physics Lab I</td><td style="width: 5%; text-align: center;">1</td><td style="width: 5%;"></td></tr> <tr><td>1321</td><td>General Physics Lab II</td><td style="text-align: center;">1</td><td></td></tr> <tr><td>2414</td><td>General Physics for Life Science Oriented Majors</td><td style="text-align: center;">4</td><td></td></tr> <tr><td>2424</td><td>General Physics for Life Science Oriented Majors</td><td style="text-align: center;">4</td><td></td></tr> </table> <p>MATH</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">1743</td><td style="width: 85%;">Calculus I for Business, Life and Social Sciences</td><td style="width: 5%; text-align: center;">3</td><td style="width: 5%;"></td></tr> </table> <p>PLANT BIOLOGY</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">1114</td><td style="width: 85%;">General Bot any</td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td colspan="4" style="text-align: center;">or</td></tr> <tr><td colspan="4">BIOLOGY</td></tr> <tr><td style="width: 5%;">1134</td><td style="width: 85%;">Introductory Biology: Evolution, Ecology, & Diversity</td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td colspan="4" style="text-align: center;">_____</td></tr> <tr><td></td><td></td><td style="text-align: center;">4</td><td></td></tr> </table> <p>HISTORY OF SCIENCE (also fulfills Gen. Ed. Western Civ.)</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">2423</td><td style="width: 85%;">Social & Ethical Issues in Science, Tech., Environment & Medicine</td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td colspan="4" style="text-align: center;">or</td></tr> <tr><td style="width: 5%;">3333</td><td style="width: 85%;">Technology & Society in World History</td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> </table> <p>RECOMMENDED COURSES: A second course in Biochemistry is strongly recommended</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">ECON 1113,</td><td style="width: 85%;">Principles of Econ. - Macro</td><td style="width: 5%;"></td><td style="width: 5%;"></td></tr> <tr><td>ECON 1123,</td><td>Principles of Econ. - Micro</td><td></td><td></td></tr> <tr><td>B AD 2113,</td><td>Intro. to Business I</td><td></td><td></td></tr> </table>	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		3653	Introduction to Biochemistry	3		1311	General Physics Lab I	1		1321	General Physics Lab II	1		2414	General Physics for Life Science Oriented Majors	4		2424	General Physics for Life Science Oriented Majors	4		1743	Calculus I for Business, Life and Social Sciences	3		1114	General Bot any			or				BIOLOGY				1134	Introductory Biology: Evolution, Ecology, & Diversity			_____						4		2423	Social & Ethical Issues in Science, Tech., Environment & Medicine			or				3333	Technology & Society in World History			ECON 1113,	Principles of Econ. - Macro			ECON 1123,	Principles of Econ. - Micro			B AD 2113,	Intro. to Business I			<p style="text-align: center;">Free Electives</p> <p>Electives to bring total applicable hours to 120 including 48 upper-division hours.</p>
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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 (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.

Year	FIRST SEMESTER	Hours	SECOND SEMESTER	Hours
FRESHMAN	CHEM 1315, General Chemistry	5	CHEM 1415, General Chemistry continued	5
	ENGL 1113, Principles of English Composition (Core I)	3	ENGL 1213, Principles of English Composition (Core I), or	3
	MATH 1743, Calculus I for Business, Life and Social Sciences (Core I)	3	EXPO 1213, Expository Writing (Core I)	
	Beginning Foreign Language (Core I)	5	P SC 1113, American Federal Government (Core III)	3
			Beginning Foreign Language continued (Core I)	5
	TOTAL CREDIT HOURS	16	TOTAL CREDIT HOURS	16
SOPHOMORE	CHEM 3053, Organic Chemistry I: Biological Emphasis	3	BIOL 1134, Intro. Biology: Evolution, Ecology and Diversity, or	4
	PHYS 1311, General Physics Lab I	1	PBIO 1114, General Botany	
	PHYS 2414, General Physics for Life Sciences Oriented Majors	4	CHEM 3153, Organic Chemistry II: Biological Emphasis	3
	Intermediate Foreign Language	3	CHEM 3152, Organic Chemistry Lab: Biological	2
	Understanding Artistic Forms (Core IV)	3	PHYS 1321, General Physics Lab II	1
			PHYS 2424, General Physics for Life Sciences Oriented Majors	4
		Social Science (Core III)	3	
	TOTAL CREDIT HOURS	14	TOTAL CREDIT HOURS	17
JUNIOR	CHEM 3653, Introduction to Biochemistry	3	CHEM 3753, Introduction to Biochemical Methods	3
	MBIO 3813, Fundamentals of Microbiology	3	MBIO 4810, Cell Biology laboratory	3
	MBIO 3812, Fundamentals of Microbiology Laboratory	2	MBIO 4843, Introduction to Molecular Biology	3
	MBIO 3113, Cell Biology	3	MBIO 3673, Practical Bioinformatics	3
	Non-Western Culture (Core IV)	3	Western Civilization & Culture (Core IV)	3
	TOTAL CREDIT HOURS	14	TOTAL CREDIT HOURS	15
SENIOR	HIST 1483, United States 1492-1865, or	3	MBIO 4853, Physiology of Microorganisms	3
	1493, United States 1865-Present (Core IV)		MBIO 4893, Capstone in Microbiology (Capstone), or	3
	MBIO 4823, Pathogenic Microbiology and Infectious Disease	3	4950, Senior Thesis-Capstone	
	MBIO Major Elective	2	MBIO 4313, Biotechnology Applications	3
	Humanities, upper-division, outside major (Gen. Ed.)	3	Humanities, upper-division, outside major (Gen. Ed.)	3
	Free Elective, lower- or upper-division	3	Free Elective, lower- or upper-division	3
	TOTAL CREDIT HOURS	14	TOTAL CREDIT HOURS	15

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://iadvice.ou.edu/>.