

Microbiology, B.S.

Microbiology is the study of microorganisms, the smallest living things on earth, including bacteria, viruses, fungi, protozoa, and algae. While microorganisms are most known for their ability to cause disease, they are actually ubiquitous on earth and central to many of the essential life processes on this planet. The field of microbiology is a major contributor to human, animal, plant, and environmental health as well as central to the food/beverage, biotechnology, bioremediation, and pharmaceutical industries. This curriculum will examine the diverse roles of microorganisms and cover the fundamentals of microbial diversity, physiology, and genetics. Students will examine the roles and interactions of microbial populations in aquatic, terrestrial, human, animal, and plant systems. A degree in microbiology can open the door to a wide variety of careers in different industries. Studying microbiology will prepare students to go to medical, dental, veterinary, or graduate school, and also provides them a highly employable career option in healthcare, industry, or government agencies. A degree in microbiology allows students to easily enter the workforce or continue on to a professional or graduate program.

Matriculation Requirements

BIOL 1610 College Biology I BB with C- or higher and approval of Biology Department advisor.

Program Requirements

Code	Title	Credit Hours
Total Credit Hours		120
General Education Requirements:		39 Credits
ENGL 1010 or ENGL 1005	Introduction to Academic Writing CC Literacies and Composition Across Contexts CC	3
ENGL 2010	Intermediate Academic Writing CC	3
MATH 1050 or MATH 1055	College Algebra QL College Algebra with Preliminaries QL	4
Complete one of the following:		3
HIST 2700 & HIST 2710	US History to 1877 AS and US History since 1877 AS (6)	
HIST 1700	American Civilization AS (3)	
HIST 1740	US Economic History AS (3)	
POLS 1000	American Heritage AS (3)	
POLS 1100	American National Government AS (3)	
Complete the following:		
PHIL 2050 or PHIL 205G	Ethics and Values IH Ethics and Values IH GI	3
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE Fitness for Life TE	2
Distribution Courses:		
BIOL 1610	College Biology I BB	4
CHEM 1210	Principles of Chemistry I PP	4
CHEM 1220	Principles of Chemistry II PP	4
Humanities Distribution		3
Fine Arts Distribution		3
Social/Behavioral Science		3
Discipline Core Requirements		52 Credits
BIOL 1615	College Biology I Laboratory	1
BIOL 1620	College Biology II	3
BIOL 1625	College Biology II Laboratory	1
MICR 3150	Microbial Ecology WE	4
MICR 3450	General Microbiology	3
MICR 3455	General Microbiology Laboratory	1
MICR 3550	Microbial Physiology	4

MICR 3650	Microbial Genetics	4
BIOL 492R	Professional Development	1
BIOL 4940	Student Seminar WE	2
BIOL 497R	Biology Colloquium (0.5 cr, two required))	1
BIOL 3600	Biological Chemistry	3
BIOL 3605	Biological Chemistry Lab	1
BIOL 4500	Principles of Evolution WE	3
PHYS 2010	College Physics I PP	4
PHYS 2015	College Physics I Lab	1
CHEM 1215	Principles of Chemistry I Laboratory	1
CHEM 1225	Principles of Chemistry II Laboratory	1
CHEM 2310	Organic Chemistry I	4
CHEM 2315	Organic Chemistry I Laboratory	1
CHEM 2320	Organic Chemistry II	4
CHEM 2325	Organic Chemistry II Laboratory	1
MATH 1100	Survey of Calculus QL	3

Elective Requirements **29 Credits**

Choose a minimum of 19 credits from: (Upper division courses are encouraged to meet upper division credit requirements) 19

MICR 3200	Emerging and Re Emerging Diseases and Zoonoses (3)	
MICR 4100	Parasitology (4)	
MICR 4200	Microbiomes WE (3)	
MICR 4300	Pathogenic Microbiology (4)	
MICR 4450	Immunology (3)	
BIOL 4455	Immunology Laboratory (1)	
MICR 4500	Virology (3)	
MICR 4505	Applied Virological Methods (3)	
MICR 4600	Arthropod-Borne Pathogens (3)	
MICR 490R	Special Topics in Microbiology (1-4)	
BIOL 3400	Cell Biology (3)	
BIOL 3405	Cell Biology Laboratory (1)	
BIOL 3550	Molecular Biology (3)	
BIOL 3555	Experiments in Molecular Biology (1)	
BIOL 4550	Molecular Evolution and Bioinformatics WE (3)	
BTEC 1010	Fundamentals of Biotechnology I Career Survey BB (3)	
BTEC 2010	DNA Manipulation and Analysis (3)	
BTEC 2020	Protein Purification and Analysis (3)	
BTEC 2030	Cell Culture Techniques (2)	
BTEC 2040	Advanced Nucleic Acid Laboratory (3)	
BOT 3500	Mycology (4)	
BOT 4430	Plant Pathology (3)	
CHEM 3020	Environmental Chemistry (3)	
CHEM 3025	Environmental Chemistry Laboratory (1)	
ENVT 1270	Environmental Microbiology (3)	

Choose 6 credits from: 6

MICR 489R	Student Research (1-4)	
BIOL 3100	Introduction to Data Analysis for Biologists (3)	
BIOL 369R	Introduction to Undergraduate Research (1)	
BIOL 4300	Bioinformatics and Genome Analysis (4)	

Choose 4 credits from BIOL, BOT, BTEC, ZOOL, or CHEM ¹ 4

1

Upper division is suggested to meet upper division requirements

Graduation Requirements

Graduation Requirements

1. Complete the required minimum 120 credit hours.
2. If an AA or AS degree has been earned, a maximum of 64 of these credits may apply toward the BS.
3. At least 30 credit hours in residence at UVU or satellite sites are required, with 10 hours earned during the last 45 hours.
4. A minimum of 40 credits must be upper-division (numbered 3000 or above).
5. A minimum of 40 credits must be in the Biology Department (BIOL, BOT, BTEC, MICR, or ZOOL prefixes), 30 of which must be upper-division. A minimum of nine Department credits must be taken at UVU.
6. Except for 490R Special Topics courses, a maximum cumulative total of 13 credits in any combination of upper division Departmental courses with an "R" designation may count toward graduation.
7. Complete Biology Department core courses with a grade of "C-" or higher in each course.
8. Achieve a minimum overall GPA of 2.0 with a minimum GPA of 2.25 in biology department courses.
9. Complete the appropriate application for graduation form.
10. Successful completion of at least one Global/Intercultural course.
11. Successful completion of two writing enriched (WE) courses.

Graduation Plan

This graduation plan is a sample plan and is intended to be a guide. Your specific plan may differ based on your Math and English placement and/or transfer credits applied. You are encouraged to meet with an advisor and set up an individualized graduation plan in Wolverine Track (<http://www.uvu.edu/wolverinetrack/>).

First Year

Semester 1		Credit Hours
BIOL 1610	College Biology I BB	4
BIOL 1615	College Biology I Laboratory	1
ENGL 1010	Introduction to Academic Writing CC	3
MATH 1050	College Algebra QL	4
FINE ARTS		3

Credit Hours	15
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Semester 2

BIOL 1620	College Biology II	3
BIOL 1625	College Biology II Laboratory	1
ENGL 2010	Intermediate Academic Writing CC	3
HUMANITIES		3
SOCIAL/BEHAVIORAL SCIENCE		3
PE/HLTH		2

Credit Hours	15
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Second Year

Semester 3

MICR 3450	General Microbiology	3
MICR 3455	General Microbiology Laboratory	1
HISTORY GE		3
CHEM 1210	Principles of Chemistry I PP	4
CHEM 1215	Principles of Chemistry I Laboratory	1
ELECTIVE		3

Credit Hours	15
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Semester 4

CHEM 1220	Principles of Chemistry II PP	4
CHEM 1225	Principles of Chemistry II Laboratory	1
PHIL 205G	Ethics and Values IH GI	3
MICR 3650	Microbial Genetics	4
MATH 1100	Survey of Calculus QL	3

Credit Hours	15
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Third Year**Semester 5**

MICR 3150	Microbial Ecology WE	4
CHEM 2310	Organic Chemistry I	4
CHEM 2315	Organic Chemistry I Laboratory	1
BIOLOGY ELECTIVE		3
ELECTIVE		3

Credit Hours	15
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Semester 6

MICR 3550	Microbial Physiology	4
CHEM 2320	Organic Chemistry II	4
CHEM 2325	Organic Chemistry II Laboratory	1
PHYS 2010	College Physics I PP	4
PHYS 2015	College Physics I Lab	1

Credit Hours	14
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Fourth Year**Semester 7**

RESEARCH ELECTIVE		3
ELECTIVE		3
BIOL 3600	Biological Chemistry	3
BIOL 3605	Biological Chemistry Lab	1
ELECTIVE		3
BIOLOGY ELECTIVE		4

Credit Hours	17
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Semester 8

BIOL 497R	Biology Colloquium	1
BIOL 492R	Professional Development	1
ELECTIVE		6
BIOL 4940	Student Seminar WE	2
RESEARCH ELECTIVE		4

Credit Hours	14
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Total Credit Hours	120
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Program Learning Outcomes

1. Apply the process of science through the use of hypothesis testing in the design and completion of scientific experiments
2. Critically evaluate scientific information
3. Quantitatively analyze scientific data through graph interpretation, statistical analysis, and problem solving
4. Effectively communicate scientific information in both written and oral formats.
5. Explain fundamental microbiological concepts including microbial genetics and molecular biology, ecology and environmental microbiology, and physiology and biochemistry