

MICROBIOLOGY, BS (L&S)

REQUIREMENTS

COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (BS)

Students pursuing a Bachelor of Science degree in the College of Letters & Science must complete all of the requirements below. The College of Letters & Science allows this major to be paired with either the Bachelor of Arts or the Bachelor of Science degree requirements.

BACHELOR OF SCIENCE DEGREE REQUIREMENTS

Mathematics Complete two courses of 3+ credits at the Intermediate or Advanced level in MATH, COMP SCI, or STAT subjects. A maximum of one course in each of COMP SCI and STAT subjects counts toward this requirement.

Language Complete the third unit of a language other than English.

L&S Breadth Complete:

- 12 credits of Humanities, which must include at least 6 credits of Literature; and
- 12 credits of Social Science; and
- 12 credits of Natural Science, which must include 6 credits of Biological Science and 6 credits of Physical Science.

Liberal Arts and Science Coursework Complete at least 108 credits.

Depth of Intermediate/Advanced Coursework Complete at least 60 credits at the Intermediate or Advanced level.

Major Declare and complete at least one major.

Total Credits Complete at least 120 credits.

UW-Madison Experience Complete both:

- 30 credits in residence, overall, and
- 30 credits in residence after the 86th credit.

Quality of Work

- 2.000 in all coursework at UW-Madison
- 2.000 in Intermediate/Advanced level coursework at UW-Madison

NON-L&S STUDENTS PURSUING AN L&S MAJOR

Non-L&S students who have permission from their school/college to pursue an additional major within L&S only need to fulfill the major requirements. They do not need to complete the L&S Degree Requirements above.

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin-Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (<http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext>) section of the *Guide*.

General Education

- Breadth—Humanities/Literature/Arts: 6 credits
- Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
- Breadth—Social Studies: 3 credits
- Communication Part A & Part B *
- Ethnic Studies *
- Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

REQUIREMENTS FOR THE MAJOR

Code	Title	Credits
Mathematics		
Complete one of the following:		5-10
MATH 171 & MATH 217	Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II	
MATH 221	Calculus and Analytic Geometry I	
Statistics		
Complete one of the following:		3
STAT 301	Introduction to Statistical Methods	
STAT 371	Introductory Applied Statistics for the Life Sciences	
General Chemistry		
Complete one of the following:		5-10
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
CHEM 109	Advanced General Chemistry	
CHEM 115 & CHEM 116	Chemical Principles I and Chemical Principles II	
Organic Chemistry		
Complete ALL of the following:		
CHEM 343	Organic Chemistry I	3
CHEM 344	Introductory Organic Chemistry Laboratory	2

CHEM 345 Organic Chemistry II 3

Biology Foundation

Complete one of the following: 10-13

BIOLOGY/
BOTANY/
ZOOLOGY 151
& BIOLOGY/
BOTANY/
ZOOLOGY 152

Introductory Biology
and Introductory Biology

BIOCORE 381
& BIOCORE 382
& BIOCORE 383
& BIOCORE 384
& BIOCORE 485

Evolution, Ecology, and Genetics
and Evolution, Ecology, and
Genetics Laboratory
and Cellular Biology
and Cellular Biology Laboratory
and Principles of Physiology

ZOOLOGY/
BIOLOGY 101
& ZOOLOGY/
BIOLOGY 102
& BOTANY/
BIOLOGY 130

Animal Biology
and Animal Biology Laboratory
and General Botany

Physics

Complete one of the following: 8-10

PHYSICS 103
& PHYSICS 104

General Physics
and General Physics

PHYSICS 207
& PHYSICS 208

General Physics
and General Physics

PHYSICS 201
& PHYSICS 202

General Physics
and General Physics

Biochemistry

Complete one of the following: 3-6

BIOCHEM 501

Introduction to Biochemistry

BIOCHEM 507
& BIOCHEM 508

General Biochemistry I
and General Biochemistry II

Microbiology Courses

Microbiology Core (all required):

Except where noted, all Microbiology Core courses are
offered every fall and spring semester.

MICROBIO 303 Biology of Microorganisms 3

MICROBIO 304 Biology of Microorganisms Laboratory 2

MICROBIO 305 Critical Analyses in Microbiology 1

MICROBIO 450 Diversity, Ecology and Evolution of Microorganisms (SPRING ONLY) 3

MICROBIO 470 Microbial Genetics & Molecular Machines 3

MICROBIO 526 Physiology of Microorganisms 3

MICROBIO 527 Advanced Laboratory Techniques in Microbiology (FALL ONLY) 2

Microbiology Capstone (required):

MICROBIO 551 Capstone Research Project in Microbiology (SPRING ONLY) 2

Microbiology Electives

Complete at least 6 credits; at least 3 credits must come
from Set A. Not all elective courses are offered every
semester.

Set A: 3-6

MICROBIO/
FOOD SCI 324 Food Microbiology Laboratory

MICROBIO/
FOOD SCI 325 Food Microbiology

MICROBIO 330 Host-Parasite Interactions

MICROBIO/
AN SCI/
BOTANY 335 The Microbiome of Plants, Animals,
and Humans

MICROBIO 345 Introduction to Disease Biology

MICROBIO 357 General Bioinformatics for Microbiologists

MICROBIO/
SOIL SCI 425 Environmental Microbiology

MICROBIO 520 Planetary Microbiology: What Life
Here Tells Us About Life Out There

MICROBIO/
SOIL SCI 523 Soil Microbiology and Biochemistry

MICROBIO/
ONCOLOGY 545 Topics in Biotechnology (topics vary
by semester)

MICROBIO 607 Advanced Microbial Genetics

MICROBIO/
BIOCHEM/
GENETICS 612 Prokaryotic Molecular Biology

MICROBIO 657 Bioinformatics for Microbiologists

MICROBIO/
BMOLCHEM 668 Microbiology at Atomic Resolution

Set B: 0-3

BIOCHEM 570 Computational Modeling of
Biological Systems

BIOCHEM/M M &
I 575 Biology of Viruses

BIOCHEM 601 Protein and Enzyme Structure and
Function

BOTANY 330 Algae

BOTANY/PL PATH Fungi
332

BOTANY/
ENTOM/PL PATH Plant-Microbe Interactions:
505 Molecular and Ecological Aspects

CHEM 665 Biophysical Chemistry

COMP SCI/
B M I 576 Introduction to Bioinformatics

F&W ECOL/SURG Diseases of Wildlife
SCI 548

FOOD SCI 550 Fermented Foods and Beverages

M M & I 301 Pathogenic Bacteriology

M M & I 341 Immunology

M M & I/ENTOM/
PATH-BIO/
ZOOLOGY 350 Parasitology

M M & I 554 Emerging Infectious Diseases and
Bioterrorism

ONCOLOGY/
M M & I/
PL PATH 640 General Virology-Multiplication of
Viruses

PATH-BIO/ M M & I 528	Immunology
PL PATH 622	Plant-Bacterial Interactions
PL PATH/ BOTANY/ GENETICS/ M M & I 655	Biology and Genetics of Fungi
Total Credits	
64-88	

ONCOLOGY/ M M & I/ PL PATH 640	General Virology-Multiplication of Viruses	3
MICROBIO/ BMOLCHEM 668	Microbiology at Atomic Resolution	3

UNIVERSITY DEGREE REQUIREMENTS

Total Degree To receive a bachelor's degree from UW-Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

Residency Degree candidates are required to earn a minimum of 30 credits in residence at UW-Madison. "In residence" means on the UW-Madison campus with an undergraduate degree classification. "In residence" credit also includes UW-Madison courses offered in distance or online formats and credits earned in UW-Madison Study Abroad/Study Away programs.

Quality of Work Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

RESIDENCE AND QUALITY OF WORK

- 2.000 GPA in all MICROBIO courses and courses approved for the major
- 2.000 GPA on 15 upper-level major credits, in residence¹
- 15 credits of MICROBIO or courses counting toward the major, taken on campus

¹ MICROBIO 300 through 699 count as upper level in the major, excluding MICROBIO 303 and MICROBIO 304. Intermediate- and advanced-level courses outside of MICROBIO that count for the major are also considered upper level.

HONORS IN THE MAJOR

Students may declare Honors in the Microbiology Major in consultation with the Microbiology undergraduate advisor.

HONORS IN THE MAJOR REQUIREMENTS

To earn Honors in the Major in Microbiology, students must satisfy both the requirements for the major (above) and the following requirements:

- Earn a 3.300 University GPA
- Earn a 3.300 GPA for all courses accepted in the major
- MICROBIO 681 and MICROBIO 682 for a total of 6 credits
- 9 credits of Honors course work (with grade B or better) from:

Code	Title	Credits
MICROBIO 303	Biology of Microorganisms	3
MICROBIO 304	Biology of Microorganisms Laboratory	2
MICROBIO 330	Host-Parasite Interactions	3
MICROBIO/ SOIL SCI 425	Environmental Microbiology	3
MICROBIO 450	Diversity, Ecology and Evolution of Microorganisms	3
MICROBIO 470	Microbial Genetics & Molecular Machines	3
MICROBIO 526	Physiology of Microorganisms	3
PATH-BIO/ M M & I 528	Immunology	3
MICROBIO 607	Advanced Microbial Genetics	3
MICROBIO/ BIOCHEM/ GENETICS 612	Prokaryotic Molecular Biology	3
PL PATH 622	Plant-Bacterial Interactions	2-3
MICROBIO 632	Industrial Microbiology/ Biotechnology	2