MICROBIOLOGY, B.S. (L&S)

REQUIREMENTS

COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (B.S.)

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.

Foreign Language
Complete the third unit of a foreign language.

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/#requirementsforundergraduatetext) 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</table>
| Mathematics
Complete one of the following: | Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II |
| MATH 171 & MATH 217 | Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II |
| STAT 301 Introduction to Statistical Methods |
| STAT 371 Introductory Applied Statistics for the Life Sciences |

Statistics
Complete one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 103</td>
<td>General Chemistry I</td>
<td>5-10</td>
</tr>
<tr>
<td>CHEM 104 &amp; CHEM 109 Advanced General Chemistry</td>
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<tr>
<td>CHEM 115 &amp; CHEM 116 Chemical Principles I and Chemical Principles II</td>
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<tr>
<td>CHEM 343 Introductory Organic Chemistry</td>
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<tr>
<td>CHEM 344 Introductory Organic Chemistry Laboratory</td>
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<tr>
<td>CHEM 345 Intermediate Organic Chemistry</td>
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</tbody>
</table>

Organic Chemistry
Complete ALL of the following:

<table>
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<tbody>
<tr>
<td>BIOLOGY/ BOTANY/ ZOOLOGY 151 &amp; BIOLOGY/ BOTANY/ ZOOLOGY 152 Introductory Biology and Introductory Biology</td>
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</tbody>
</table>
BIOCORE 381 & BIOCORE 382 & BIOCORE 383 & 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
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/SOIL SCI 425
Environmental Microbiology
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 332
Fungi
BOTANY/ENTOM/PL PATH 505
Plant-Microbe Interactions:
Molecular and Ecological Aspects
CHEM 565
Biophysical Chemistry
COMP SCI/B M I 576
Introduction to Bioinformatics
F&W ECOL/SURG SCI 548
Diseases of Wildlife
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
M M & I 555
Vaccines: Practical Issues for a Global Society
M M & I/Pop HLTH 603
Clinical and Public Health Microbiology
ONCOLOGY/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
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 residence\(^1\)
• 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:

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<tr>
<td>MICROBIO 303</td>
<td>Biology of Microorganisms</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO 304</td>
<td>Biology of Microorganisms Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>MICROBIO 330</td>
<td>Host-Parasite Interactions</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO/</td>
<td>Environmental Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI 425</td>
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<td></td>
</tr>
<tr>
<td>MICROBIO 450</td>
<td>Diversity, Ecology and Evolution of Microorganisms</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO 470</td>
<td>Microbial Genetics &amp; Molecular Machines</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO 526</td>
<td>Physiology of Microorganisms</td>
<td>3</td>
</tr>
<tr>
<td>PATH-BIO/528</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO 607</td>
<td>Advanced Microbial Genetics</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO/BIOCHEM/GENETICS 612</td>
<td>Prokaryotic Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>PL PATH 622</td>
<td>Plant-Bacterial Interactions</td>
<td>2-3</td>
</tr>
<tr>
<td>MICROBIO 632</td>
<td>Industrial Microbiology/Biotechnology</td>
<td>2</td>
</tr>
<tr>
<td>ONCOLOGY/PL PATH 640</td>
<td>General Virology-Multiplication of Viruses</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO/BMOLCHEM 668</td>
<td>Microbiology at Atomic Resolution</td>
<td>3</td>
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</tbody>
</table>

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.