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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</thead>
<tbody>
<tr>
<td>Mathematics</td>
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<tr>
<td>Complete one of the following:</td>
<td>Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II</td>
<td>5-10</td>
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<tr>
<td>MATH 171 &amp; MATH 217</td>
<td>Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II</td>
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<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry I</td>
<td>3</td>
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<tr>
<td>Statistics</td>
<td></td>
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<tr>
<td>Complete one of the following:</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
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<tr>
<td>STAT 301</td>
<td>Introduction to Statistical Methods</td>
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<tr>
<td>STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences</td>
<td></td>
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<tr>
<td>General Chemistry</td>
<td></td>
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<tr>
<td>Complete one of the following:</td>
<td>General Chemistry I and General Chemistry II</td>
<td>5-10</td>
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<tr>
<td>CHEM 103 &amp; CHEM 104</td>
<td>General Chemistry I and General Chemistry II</td>
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<tr>
<td>CHEM 109</td>
<td>Advanced General Chemistry</td>
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<tr>
<td>CHEM 115 &amp; CHEM 116</td>
<td>Chemical Principles I and Chemical Principles II</td>
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<tr>
<td>Organic Chemistry</td>
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<tr>
<td>Complete ALL of the following:</td>
<td>Organic Chemistry I</td>
<td>3</td>
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<tr>
<td>CHEM 343</td>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 344</td>
<td>Introductory Organic Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 345</td>
<td>Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>Biology Foundation</td>
<td></td>
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<tr>
<td>Complete one of the following:</td>
<td>Introductory Biology and Introductory Biology</td>
<td>10-13</td>
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<tr>
<td>BIOLOGY/BOTANY/ZOOLOGY 151 &amp; BIOLOGY/BOTANY/ZOOLOGY 152</td>
<td>Introductory Biology and Introductory Biology</td>
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Microbiology, B.S. (L&S)  

**Microbiology Core (all required):**
- MICROBIO 303 Biology of Microorganisms 3
- MICROBIO 304 Biology of Microorganisms 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:**
- MICROBIO/FOOD SCI 324 Food Microbiology Laboratory 3
- MICROBIO/FOOD SCI 325 Food Microbiology 3
- MICROBIO 330 Host-Parasite Interactions 3
- MICROBIO/AN SCI/BOTANY 335 The Microbiome of Plants, Animals, and Humans 3

**Set B:**
- 0-3
- BIOCHEM 570 Computational Modeling of Biological Systems 3
- BIOCHEM/M M & I 575 Biology of Viruses 3
- BIOCHEM 601 Protein and Enzyme Structure and Function 3
- BOTANY 330 Algae 3
- BOTANY/PL PATH 332 Fungi 3
- BOTANY/ENTOM/PL PATH/BIO/ ZOOLOGY 505 Plant-Microbe Interactions: Molecular and Ecological Aspects 3
- CHEM 565 Biophysical Chemistry 3
- COMP SCI/B M I 576 Introduction to Bioinformatics 3
- F&W ECOL/SURG SCI 548 Diseases of Wildlife 3
- FOOD SCI 550 Fermented Foods and Beverages 3
- M M & I 301 Pathogenic Bacteriology 3
- M M & I 341 Immunology 3
- M M & I/ENTOM/PATH-BIO/ ZOOLOGY 350 Parasitology 3
- M M & I 554 Emerging Infectious Diseases and Bioterrorism 3
- M M & I 555 Vaccines: Practical Issues for a Global Society 3
- M M & I/POP HLTH 603 Clinical and Public Health Microbiology 3
- ONCOLOGY/PL PATH 640 General Virology-Multiplication of Viruses 3
- PATH-BIO/M M & I 528 Immunology 3
- PL PATH 622 Plant-Bacterial Interactions 3
- PL PATH/BOTANY/GENETICS/M M & I 655 Biology and Genetics of Fungi 3

**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
- 15 credits of MICROBIO or courses counting toward the major, taken on campus

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 of 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:

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<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>
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<tr>
<td>SOIL SCI 425</td>
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<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/</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>M M &amp; I 528</td>
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<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/PLPATH 640</td>
<td>General Virology-Multiplication of Viruses</td>
<td>3</td>
</tr>
<tr>
<td>MICROBIO/</td>
<td>Microbiology at Atomic Resolution</td>
<td>3</td>
</tr>
<tr>
<td>BMOLCHEM 668</td>
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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.