MICROBIOLOGY, B.S. (CALS)

REQUIREMENTS

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.

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

In addition to the University General Education Requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies, Science, and Capstone), but courses counted toward university requirements may also be used to satisfy a college and/or a major requirement; similarly, courses counted toward college requirements may also be used to satisfy a university and/or a major requirement.

COLLEGE REQUIREMENTS FOR ALL CALS B.S. DEGREE PROGRAMS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Quality of Work: Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation.</td>
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<td></td>
<td>Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree.</td>
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<td></td>
<td>First Year Seminar (<a href="http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext">http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext</a>)</td>
<td>1</td>
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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 103</td>
<td>General Chemistry I</td>
<td>5-10</td>
</tr>
<tr>
<td>or CHEM 108</td>
<td>Chemistry in Our World</td>
<td></td>
</tr>
<tr>
<td>or CHEM 109</td>
<td>Advanced General Chemistry</td>
<td></td>
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<tr>
<td>Biological Science</td>
<td>5</td>
<td></td>
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<tr>
<td>Additional Science (Biological, Physical, or Natural)</td>
<td>3</td>
<td></td>
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<tr>
<td>Science Breadth (Biological, Physical, Natural, or Social)</td>
<td>3</td>
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<td>CALS Capstone Learning Experience: included in the requirements for each CALS major (see &quot;Major Requirements&quot;) (<a href="http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext">http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext</a>)</td>
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REQUIREMENTS FOR THE MAJOR

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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>MATH 171 &amp; MATH 217</td>
<td>Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II</td>
<td>5-10</td>
</tr>
<tr>
<td>STAT 301</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences</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>
<td></td>
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<tr>
<td>CHEM 343</td>
<td>Introductory Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 344</td>
<td>Introductory Organic Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 345</td>
<td>Intermediate Organic Chemistry</td>
<td>3</td>
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Biology Foundation

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<th>Code</th>
<th>Title</th>
<th>Credits</th>
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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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International Studies (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext) | 3 |

Physical Science Fundamentals | 4-5 |
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**
Select 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
MICROBIO 304
Biology of Microorganisms Laboratory
MICROBIO 305
Critical Analyses in Microbiology
MICROBIO 450
Diversity, Ecology and Evolution of Microorganisms
MICROBIO 470
Microbial Genetics & Molecular Machines
MICROBIO 526
Physiology of Microorganisms
MICROBIO 527
Advanced Laboratory Techniques in Microbiology (FALL ONLY)

*Microbiology Capstone (required):*
MICROBIO 551
Capstone Research Project in Microbiology (SPRING ONLY)

**Microbiology Electives**
Complete at least 6 credits; at least 3 credits must come from Set A. Note that 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

**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

**Total Credits:** 64-88

**Notes:**
1. Offered every semester.
2. Required for Microbiology Laboratory.
3. Offered every spring semester.
4. Required for Microbiology Laboratory.
5. Offered every fall semester.
6. Offered every spring semester.
7. Offered every fall semester.
8. Offered every spring semester.
(BIOLOGY/BOTANY/ZOOLOGY 151 and BIOLOGY/BOTANY/ZOOLOGY 152) or (BIOCORE 381 / BIOCORE 382 / BIOCORE 383 / BIOCORE 384 / BIOCORE 485) are recommended.

1 (PHYSICS 103 / PHYSICS 104) or (PHYSICS 207 / PHYSICS 208) are recommended.

HONORS IN THE MAJOR

Students admitted to the university and to the College of Agricultural and Life Sciences are invited to apply to be considered for admission to the CALS Honors Program.

Admission Criteria for New First-Year Students:

- Complete program application including essay questions

Admission Criteria for Transfer and Continuing UW-Madison Students:

- UW-Madison cumulative GPA of at least 3.25
- Complete program application including essay questions

HOW TO APPLY

The application is available on the CALS Honors Program website (https://cals.wisc.edu/academics/undergraduate-students/outside-the-classroom/honors-program/). Applications are accepted at any time.

New first-year students with accepted applications will automatically be enrolled in Honors in Research. It is possible to switch to Honors in the Major in the student’s first semester on campus after receiving approval from the advisor for that major. Transfer and continuing students may apply directly to Honors in Research or Honors in the Major (after approval from the major advisor).

REQUIREMENTS

All CALS Honors programs have the following requirements:

- Earn at least a cumulative 3.25 GPA at UW-Madison (some programs have higher requirements)
- Complete the program-specific requirements listed below
- Submit completed thesis documentation to CALS Academic Affairs

HONORS IN THE MAJOR IN MICROBIOLOGY: REQUIREMENTS

To earn Honors in the Major in Microbiology, students must satisfy the Requirements for the Major (above) as well as the following requirements. All courses used for Honors in the Major requirements must receive “B” or better grades to fulfill requirements.

- Earn a 3.300 overall university GPA.
- Earn a 3.300 GPA for all MICROBIO courses, and all courses accepted in the major.
- Complete a two-semester Senior Honors Thesis (MICROBIO 681 and MICROBIO 682) for 6 credits total and present research in a public forum. Students completing their senior honors theses in laboratories or departments outside of Microbiology may be able to count that thesis toward Honors in the Major.
- Complete at least 20 credits of any combination of the following coursework:
  - Honors courses that fulfill Requirements for the Major (see above); independent study and thesis credits do not count here.
  - Non-honors coursework credits from this list: CHEM 115, CHEM 311, CHEM 327, GENETICS 466, MATH 222, MATH 234. These courses do not need to be taken for honors to count.
  - At least 10 of the 20 credits of coursework above must come from courses taken for honors off this Microbiology course list: MICROBIO 303, MICROBIO 304, MICROBIO/FOOD SCI 325, MICROBIO 330, MICROBIO/AN SCI/BOTANY 335, MICROBIO 345, MICROBIO/SOIL SCI 425, MICROBIO 450, MICROBIO 470, MICROBIO 526, MICROBIO 607, MICROBIO/BIOCHEM/GENETICS 612, MICROBIO 657, MICROBIO/BMOLCHEM 668.

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.