

MICROBIOLOGY, BS (CAL S)

The smallest living things – including bacteria, viruses, and yeast – may not be visible to the human eye, but they have big effects on health, food, medicine, energy, and the environment. These tiny organisms, called microbes, were the first life forms on Earth and continue to influence the planet in significant ways. Microbiomes – communities of microbes – are increasingly studied by researchers focusing on human health, global warming, infectious disease, environmental remediation, bioenergy, and much more.

The microbiology major prepares students for modern research in microbiology with a heavy emphasis on practical laboratory experiences. Students learn the cellular biology, genetics, ecology, evolution, and physiology of microbes. Through courses, students learn laboratory techniques – gaining the type of hands-on experiences with modern equipment that employers and graduate and professional schools seek. Additionally, students can conduct mentored and independent research projects in faculty laboratories where they will learn to critically evaluate scientific data, carry out laboratory experiments, and communicate scientific information.

Microbiology majors graduate prepared for careers in biotechnology, education, healthcare, information technology, and food safety. Many students pursue graduate and professional studies, including medical school, dental school, and biological sciences PhD programs.

LEARN THROUGH HANDS-ON, REAL-WORLD EXPERIENCES

With so many microbiologists on the faculty, students have numerous opportunities to conduct research in faculty labs. As one of the largest research buildings on campus, students have access to state-of-the-art facilities and are able to conduct cutting-edge experiments using novel techniques that few other undergraduate programs allow. Through a senior-year capstone course, students conduct research under the direction of a professor or as part of class projects that have included culturing microbes from the gut of hibernating ground squirrels, comparing bacteria from the mouths of athletes and non-athletes, and culturing microbes found in deep sea vents. This kind of hands-on experience distinguishes microbiology majors from other graduates and enhances the real-world skills that are valued by post-secondary schools and employers.

BUILD COMMUNITY AND NETWORKS

Through the Microbiology Club, students establish study groups, explore careers, and teach others on campus and in the community about microbiology. Through events like cheese, yogurt, and kombucha making, the club offers opportunities for community-building both within the program and with the broader university community. This student organization is the official American Society of Microbiology undergraduate chapter for the UW–Madison and provides annual travel and research awards to outstanding students.

CUSTOMIZE A PATH OF STUDY

Core courses focus on the diversity, genetics, biochemistry, and physiology of microorganisms. A variety of elective courses provide the

opportunity to study environmental microbiology, food microbiology, microbial pathogenesis, immunology, virology, microbiomes, microbial biotechnology, and public health, as well as advanced topics in microbial genetics and physiology. Students may also pursue honors in microbiology.

MAKE A STRONG START

All courses in the program, including entry-level courses, are taught by faculty who specialize in teaching microbiology.

GAIN GLOBAL PERSPECTIVE

Majors can also choose from a variety of study abroad programs including short-term field experiences, summer research opportunities, and semester-long exchange programs at top universities around the world. A study abroad program in Thailand specifically tailored for microbiology majors is frequently offered and led by microbiology faculty from UW–Madison. Students can explore studying abroad as a microbiology major by utilizing the Microbiology Major Advising Page. Students work with their advisor and the CALS study abroad office to identify appropriate programs.

HOW TO GET IN

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Students may declare the major via an appointment with the undergraduate advisor at any time.

To declare this major, students must be admitted to UW–Madison and the College of Agricultural and Life Sciences (CAL S). For information about becoming a CAL S first-year or transfer student, see Entering the College (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#enteringthecollegertext>).

Students who attend Student Orientation, Advising, and Registration (SOAR) with the College of Agricultural and Life Sciences have the option to declare this major at SOAR. Students may otherwise declare after they have begun their undergraduate studies. For more information, contact the advisor listed in the Contact Box for the major.

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/#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.

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 BS DEGREE PROGRAMS

Code	Title	Credits
	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.	
	Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree.	
	First year seminar (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSThirdYearSeminarCourses)	1
	International studies (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSIInternationalStudiesCourses)	3
	Physical science fundamentals	4-5
CHEM 103	General Chemistry I	
or CHEM 108	Chemistry in Our World	
or CHEM 109	Advanced General Chemistry	
	Biological science	5
	Additional science (biological, physical, or natural)	3
	Science breadth (biological, physical, natural, or social)	3
	CALS Capstone Learning Experience: included in the requirements for each CALS major (see "major requirements") (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSCapstoneRequirement)	

MAJOR REQUIREMENTS

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 ¹	
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 ¹	
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 ²	
PHYSICS 207 & PHYSICS 208	General Physics and General Physics ²	
PHYSICS 201 & PHYSICS 202	General Physics and General Physics	

Biochemistry

Complete one of the following: 3-6

BIOCHEM 501 Introduction to Biochemistry

BIOCHEM 507 General Biochemistry I
& BIOCHEM 508 and General Biochemistry II**Microbiology Courses***Microbiology Core:*

Complete all of the following courses (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. Note that not all elective courses are offered every semester.

Set A: 3-6

MICROBIO/
FOOD SCI 324 Food Microbiology LaboratoryMICROBIO/
FOOD SCI 325 Food Microbiology

MICROBIO 330

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 525 Field Studies of Planetary Microbiology and Life in the Universe

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

MICROBIO 607

MICROBIO/
BIOCHEM/
GENETICS 612 Prokaryotic Molecular Biology

MICROBIO 626 Microbial and Cellular Metabolomics

MICROBIO 657 Bioinformatics for Microbiologists

MICROBIO/
BMOLCHEM 668 Microbiology at Atomic Resolution

Set B: 0-3

BIOCHEM 570

BIOCHEM/M M &
I 575 Biology of Viruses

BIOCHEM 601 Protein and Enzyme Structure and Function

BOTANY 330 Algae

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

CHEM 665 Biophysical Chemistry

COMP SCI/
B M I 576 Introduction to BioinformaticsF&W ECOL/
SCI 548 SURG 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

ONCOLOGY/
M M & I/
PL PATH 640 General Virology-Multiplication of VirusesPATH-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**¹ (BIOLOGY/BOTANY/ZOOLOGY 151 and BIOLOGY/BOTANY/
ZOOLOGY 152) or (BIOCORE 381 / BIOCORE 382 / BIOCORE 383 /
BIOCORE 384 / BIOCORE 485) are recommended.² (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/current-students/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

MICROBIOLOGY HONORS IN THE MAJOR 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 from the following coursework:
 - 6 or more of the 20 credits must be courses taken for honors from the list below. Courses completed from this list may count towards both major requirements and honors requirements.

Core and Foundation Honors Coursework

Code	Title	Credits
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	2
MICROBIO 551	Capstone Research Project in Microbiology	2
BIOCHEM 507	General Biochemistry I	3

BIOCHEM 508	General Biochemistry II	3-4
PHYSICS 201	General Physics	5
PHYSICS 202	General Physics	5
PHYSICS 207	General Physics	5
PHYSICS 208	General Physics	5
STAT 301	Introduction to Statistical Methods	3
STAT 371	Introductory Applied Statistics for the Life Sciences	3

- Other courses taken for honors that fulfill requirements for the major (see major requirements above). Includes the following coursework: set A microbiology electives, set B microbiology electives, BIOCORE 381, BIOCORE 382, BIOCORE 383, BIOCORE 384, BIOCORE 485, BIOLOGY/BOTANY/ZOOLOGY 151, BIOLOGY/BOTANY/ZOOLOGY 152. Independent study and thesis credits do not count to meet this honors requirement.
- Set A microbiology electives completed beyond the major requirements. See major requirements above for the list of set A microbiology electives. This coursework does not need to be taken for honors but cannot count towards both major requirements and honors requirements.
- Honors coursework in MATH, CHEM, or PHYSICS from the lists below:

Math

Code	Title	Credits
MATH 341	Linear Algebra	3
MATH 375	Topics in Multi-Variable Calculus and Linear Algebra	5
MATH 376	Topics in Multi-Variable Calculus and Differential Equations	5
MATH 521	Analysis I	3
MATH 522	Analysis II	3
MATH 541	Modern Algebra	3
MATH 542	Modern Algebra	3

Chemistry

Code	Title	Credits
CHEM 109	Advanced General Chemistry	5
CHEM 115	Chemical Principles I	5
CHEM 116	Chemical Principles II	5
CHEM 343	Organic Chemistry I	3
CHEM 345	Organic Chemistry II	3
CHEM 344	Introductory Organic Chemistry Laboratory	2
CHEM 329	Fundamentals of Analytical Science	4
CHEM 547	Advanced Organic Chemistry	3
CHEM 561	Physical Chemistry I	3
CHEM 563	Physical Chemistry Laboratory I	1
CHEM 562	Physical Chemistry II	3
CHEM 564	Physical Chemistry Laboratory II	1
CHEM 665	Biophysical Chemistry	3

Physics

Code	Title	Credits
PHYSICS 201	General Physics	5
PHYSICS 202	General Physics	5
PHYSICS 207	General Physics	5
PHYSICS 208	General Physics	5
PHYSICS 241	Introduction to Modern Physics	3
PHYSICS 247	A Modern Introduction to Physics	5
PHYSICS 248	A Modern Introduction to Physics	5
PHYSICS 249	A Modern Introduction to Physics	4

BIOCORE

Code	Title	Credits
BIOCORE 486	Principles of Physiology Laboratory	2
BIOCORE 587	Biological Interactions	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.

LEARNING OUTCOMES**LEARNING OUTCOMES**

1. Develop a fundamental understanding of the principles of microbiology and the necessary skills for a professional career in microbiology
2. Apply the scientific method to questions. Formulate a hypothesis, gather data, and analyze that data to assess the degree to which their work supports the hypothesis.
3. Demonstrate proficiency in the techniques used in microbiology and an ability to critically analyze data and integrate ideas for problem solving
4. Access the primary and secondary literature and, in combination with their own findings, effectively communicate their ideas both orally and in written form.
5. Learn about and demonstrate personal and professional ethics.

FOUR-YEAR PLAN**FOUR-YEAR PLAN**

This sample four-year plan is a tool to assist students and their advisors.

Students should use their DARS report, the degree planner, Guide requirements, and the course search & enroll tools to make their own four-year plan based on their placement scores, credit for transferred courses and approved examinations, and individual interests. Students must complete at least 120 total credits to be eligible for graduation.

Students planning to pursue graduate studies in a biological science are encouraged to take MATH 222, PHYSICS 201/ PHYSICS 202 or PHYSICS 207/PHYSICS 208, and BIOCHEM 507/BIOCHEM 508 (see footnote 7). Also recommended: CHEM 565 and MICROBIO/BIOCHEM/ GENETICS 612 Prokaryotic Molecular Biology.

SAMPLE MICROBIOLOGY FOUR-YEAR PLAN**Freshman**

Fall	Credits Spring	Credits
General Chemistry ¹	4-5 Gen Chem or Electives ¹	5
Math ²	3 Math ²	3-5
COMM-A	3 Electives ³	6
First-Year Seminar	1	
Elective ³	3	
14-15		14-16

Sophomore

Fall	Credits Spring	Credits
CHEM 343	3 CHEM 344	2
Math ²	3-5 CHEM 345	3
Intro Biology, Semester ¹ ⁴	5 Intro Biology, Semester ² ⁴	5
Elective ³	3 Electives ³	6
14-16		16

Junior

Fall	Credits Spring	Credits
General Physics, Semester ¹ ⁵	4-5 General Physics, Semester ² ⁵	4-5
MICROBIO 303	3 MICROBIO 470	3
MICROBIO 304	2 BIOCHEM 501 ⁷	3
MICROBIO 305	1 Research ⁶	1-4
Research ⁶	1-4 Electives (for major or other) ³	0-4
Electives (to reach 15 crs) ³	0-4	
11-19		11-19

Senior

Fall	Credits Spring	Credits
MICROBIO 526	3 MICROBIO 450	3
MICROBIO 527	2 MICROBIO 551	2
Research ⁶	1-4 Research ⁶	1-4

Electives (for major or other) ³	6-9 Electives (for major or other) ³	7-10
	12-18	13-19

Total Credits 105-138

- Choose 1 of 3 sequences: (CHEM 103/CHEM 104) or CHEM 109 or (CHEM 115/CHEM 116). Students who take CHEM 109 and plan to attend medical or other professional schools are advised to take one additional inorganic course (CHEM 311 or CHEM 327).
- Math course determined by placement scores. Microbiology majors must complete math through calculus (choose from MATH 171/MATH 217 or MATH 221), and statistics (choose from STAT 301 or STAT 371).
- Electives can be scheduled according to the student's preference. Consult your advisor and the requirements tab.
- The three choices are 1) ZOOLOGY/BIOLOGY/BOTANY 151 and ZOOLOGY/BIOLOGY/BOTANY 152; 2) ZOOLOGY/BIOLOGY 101, ZOOLOGY/BIOLOGY 102 and BOTANY/BIOLOGY 130; or 3) Biocore. Biocore is a 3 to 4 semester sequence. Students must complete the first three lectures and the first two labs. The Biocore courses are BIOCORE 381, BIOCORE 382, BIOCORE 383, BIOCORE 384, BIOCORE 485, BIOCORE 486, BIOCORE 587.
- Physics may be taken in year 1, 2, 3, or 4 depending on the student's schedule.
- Undergraduate research courses include MICROBIO 299, MICROBIO 699, MICROBIO 681, MICROBIO 682 (honors thesis), MICROBIO 691, MICROBIO 692 (thesis). Both semesters are required for thesis credit. Students are encouraged to take several semesters of research (internship opportunities, MICROBIO 399, are also encouraged).
- If BIOCHEM 507 General Biochemistry I and BIOCHEM 508 General Biochemistry II are taken, both semesters must be completed (with the recommendation of BIOCHEM 507 in fall semester of year 3 and BIOCHEM 508 in spring semester of year 3).

THREE-YEAR PLAN**THREE-YEAR PLAN**

This sample three-year plan is a tool to assist students and their advisor(s). Students should use it - along with their DARS report, the Degree Planner, and Course Search & Enroll tools - to make their own three-year plan based on their placement scores, credit for transferred courses and approved examinations, and individual interests.

Three-year plans may vary considerably from student to student, depending on their individual preparation and circumstances. Students interested in graduating in three years should meet with an academic advisor early and often to discuss feasibility, appropriate course sequencing, post-graduation plans (careers, graduate school, etc.), and considerations they might make in pursuit of a three-year graduation plan.

While there are many advantages to attending four years of college, including making the most of research and study abroad opportunities, exploring alternative majors, completing additional majors and certificates, developing skills and interests through student groups, and personal growth, students may have reasons for wishing to graduate in fewer than four years.

The example plan assumes that students will:

- enter their first year with 20 advanced standing credits, including equivalency credit for MATH 221
- declare their major first year
- take two summer terms
- enroll in at least 15-16 credits in the fall/spring semesters

SAMPLE MICROBIOLOGY THREE-YEAR PLAN

Code	Title	Credits
Courses taken the summer before arriving on campus		
INTER-AG 140	CALS QuickStart: Foundations	1
INTER-AG 141	QuickStart: Connect2Campus	1
<i>Total Credits:</i>		2
First Year		
Fall	Credits Spring	Credits Summer
CHEM 103	4 CHEM 104	5 MICROBIO 303
Comm A Requirement	3 BIOLOGY/BOTANY/ZOOLOGY 151	5 MICROBIO 304
STAT 371 or 301	3 Elective	3
Humanities breadth	3 Humanities breadth	3
Social Science breadth	3	
	16	16
		5
Second Year		
Fall	Credits Spring	Credits
CHEM 343	3 CHEM 345	3
BIOLOGY/BOTANY/ZOOLOGY 152	5 CHEM 344	2
MICROBIO 470	3 BIOCHEM 501	3
International Studies CALS requirement	3 MICROBIO 305	1
Elective	2 Elective ²	3
	Ethnic Studies	3
	16	15
Third Year		
Fall	Credits Spring	Credits
MICROBIO 527	2 MICROBIO 551	2
MICROBIO 526	3 PHYSICS 104 or 208	4-5
PHYSICS 103 or 207	4-5 MICROBIO 450	3
Major Elective	3 Major Elective	3
Elective ²	3 Elective ²	3
	15-16	15-16
Total Credits 98-100		

Students must earn **120 total credits** to graduate, including accepted advanced standing or transfer credits. The above charts reflect 100-102

total credits from six fall/spring semesters and two summer terms, including courses taken in the summer before the first year.

¹ The Microbiology major recommends INTER-AG 140 CALS QuickStart: Foundations or INTER-AG 141 QuickStart: Connect2Campus for the first-year seminar requirement. However, this requirement can be fulfilled through courses offered in Fall and Spring semester of the first year.

² The Microbiology major encourages students with an interest in research to work with faculty through independent research courses as electives.

ADVISING AND CAREERS

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ADVISING

Each student is assigned a professional academic advisor who works to understand student goals and helps to craft a path that best suits their needs. Additionally, faculty provide students with ongoing professional and scientific mentorship. More than 60% of students in the major conduct faculty-directed research. With low ratios of students to faculty, students also receive additional faculty mentoring in the classroom.

Current UW–Madison students should use Starfish to schedule an appointment with an advisor in the Biochemistry & Microbiology Undergraduate Advising Hub (<https://biochemmicrobio.wisc.edu/>).

CAREER OPPORTUNITIES

Alumni hold professional positions as physicians, research scientists, public health officials, dentists, optometrists, physician assistants, physical therapists, master brewers, quality control officers, health inspectors, professors, and more.

Graduates are recognized for their skills in laboratory research and scientific communication, skills that are valued by potential employers and professional schools.

PEOPLE

PEOPLE

RESEARCH FACULTY

Daniel Amador–Noguez

Karthik Anantharaman

Jean-Michel Ané

Briana Burton

Kerri Coon

Timothy J. Donohue

Katrina T. Forest (Chair)

David Hershey

Betül Kaçar

Charles W. Kaspar

Erica L–W Majumder

Katherine D. McMahon

Charlie Mo

Sabine Pellett

Federico E. Rey

Garret Suen

Michael G. Thomas

Jade Wang

Jae-Hyuk Yu

TEACHING FACULTY

Melissa Christopherson

Timothy D. Paustian

Jon T. Roll

Michelle R. Rondon

Betty Slinger

ACADEMIC ADVISORS

Biochemistry & Microbiology Undergraduate Advising Hub (<https://biochemmicrobio.wisc.edu/advising/>)

For more information, see the Department of Bacteriology directory (<https://bact.wisc.edu/people.php>).

WISCONSIN EXPERIENCE

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A RICH HISTORY OF MICROBIOLOGY

UW–Madison is recognized as one of the birthplaces of Microbiology, as recognized by the American Society for Microbiology's *Milestones in Microbiology*. UW–Madison is the first school to teach microbiology in the U.S., and it is consistently ranked as one of the top public schools in the field.

RESEARCH EXPERIENCE

The majority of microbiology majors conduct research in a faculty-led research lab where they receive direct mentorship from professors, scientists, and graduate students. Because UW–Madison has the highest concentration of microbiologists on any U.S. campus, students have many research options.

STUDENT ORGANIZATION

The Microbiology Club is the undergraduate-led student chapter of the American Society of Microbiology. Follow them on Twitter at @MadisonMicrobio (<https://twitter.com/madisonmicrobio/>).

GLOBAL ENGAGEMENT

Microbiology majors can participate in several international academic experiences including short-term field experiences, summer research opportunities, and semester-long exchange programs at top universities around the world. The UW Microbiology and Public Health in Northern Thailand program occurs during the summer.

COMMUNITY ENGAGEMENT AND VOLUNTEERING

Our students engage in numerous volunteer activities spearheaded by the Microbiology Club. This involves explaining microbiology and its impact during public educational events at UW–Madison. Many students also volunteer at local public schools to teach microbiology to elementary-aged students.

RESOURCES AND SCHOLARSHIPS

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Students in the College of Agricultural and Life Sciences receive more than \$1.25 million in scholarships annually. Learn more about college scholarships at <https://cals.wisc.edu/academics/undergraduate-students/financing-your-education/cals-scholarships/>.

The Department of Bacteriology offers several scholarships to students in the microbiology major. Awards are given annually and fund undergraduate research, provide travel stipends to microbiology students attending professional scientific conferences, or recognize outstanding graduating seniors. Learn more at <https://bs.microbiology.wisc.edu/awards-and-scholarships/>.