MICROBIOLOGY, BS (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/ #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.

,	st complete 30 degree credits in n after earning 86 credits toward ree.	
First year seminar (http:/ undergraduate/agricultu #CALSFirstYearSeminar	ral-life-sciences/	1
International studies (htt undergraduate/agricultu #CALSInternationalStuc	ral-life-sciences/	3
Physical science fundam	entals	4-5
CHEM 103 Ge	eneral Chemistry I	
or CHEM 108 Cł	nemistry in Our World	
or CHEM 109 Ac	lvanced 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 1		
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	e 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	

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A BIOLONY MICROBIO MICROBIO MICROBIO The Microbiane of Plants, Animals, and Humans BIOLONE 38 Evolution, Ecology, and Genetics MICROBIO 35 Introduction to Disease Biology 8 BIOCORE 393 Genetal Biology 1 MICROBIO 35 Introduction to Disease Biology 8 BIOCORE 393 Genetal Biology 1 MICROBIO 350 Environmental Microbiology 8 BIOCORE 394 and Cellular Biology 1 MICROBIO 350 Environmental Microbiology 8 BIOCORE 395 and Cellular Biology 1 MICROBIO 350 Environmental Microbiology 8 BIOCORE 394 and Cellular Biology 1 MICROBIO 350 Environmental Microbiology 8 BIOCORE 394 and Cellular Biology 1 MICROBIO 350 Environmental Microbiology 8 BIOCORE 395 General Biology 1 MICROBIO 350 Field Studies of Planetary 8 BIOCORE 395 General Biology 1 MICROBIO 355 Field Studies of Planetary 8 BIOCORE 395 General Physics MICROBIO 355 Biology 10 MICROBIO 350 9 Physics 100 General Physics 2 MICROBIO 350 MICROBIO 350 MICROBIO 350 9 Physics 2001 General Physics 2 MICROBIO 350 MICROBIO 350 MICROBIO 350 9 Physics 100 General Physics 2 MICROBIO 350 MICROBIO 350 MICROBIO 350 <th>BIOLOGY/ BOTANY/ ZOOLOGY 151</th> <th>Introductory Biology and Introductory Biology ¹</th> <th></th> <th>MICROBIO/ FOOD SCI 325 MICROBIO 330</th> <th>Food Microbiology</th>	BIOLOGY/ BOTANY/ ZOOLOGY 151	Introductory Biology and Introductory Biology ¹		MICROBIO/ FOOD SCI 325 MICROBIO 330	Food Microbiology
BIOCORE 281 Evolution, Ecology, and Genetics & BIOCORE 383 General Bioinformatics for & BIOCORE 383 General Bioinformatics for & BIOCORE 384 and Principale Receivery, advantage & BIOCORE 385 and Principale of Physiology ¹ & BIOCORE 385 and Principale of Physiology ¹ & BIOCORE 385 and Principale of Physiology ¹ BIOLORY 100 and Annota Biology Laboratory & BIOCORE 385 and Sincipale of Physiology ² BIOLORY 100 and Annota Biology Laboratory & BIOCORE 385 and Sincipale of Physiology BIOLORY 100 Biology Laboratory BIOLORY 100 Bio	BOTANY/			MICROBIO/ AN SCI/	
8. BIOCCRE 352 and Evolution, Ecology, and Subject CRE 353 and Evolution Ecology and Subject 2001 COV and Principles of Physiology ¹ 8. BIOCCRE 353 and Cellular Biology and Principles of Physiology ¹ MICROBIO 237 Environmental Microbiology; What Life Here Tells Us About Life Out There 3. 200L COV; and Annual Biology Laboratory and Principles of Physiology ¹ 8. BIOCCRE 352 and General Biology BIOLOCY 103 and Annual Biology Laboratory and Principles of Physiology ¹ 9. BioLocy 102 and General Physics Subject 2002 Cov Physics 104 Biology Cov Sint C	BIOCORE 381	Evolution, Ecology, and Genetics			Introduction to Disease Biology
& BIOCORE 445 and Cellular Biology Laboratory and Principles of Physiology ¹ ZOOLOGY Animal Biology BIOLOGY 101 and Animal Biology BIOLOGY 102 BIOLOGY 102 BIOLOGY 103 General Physics Physics BIOLOGY 102 Select one of the following: B-10 PHYSICS 103 General Physics ² PHYSICS 200 General Physics ² PHYSICS 201 General Physics ² PHYSICS 202 and General Physics ² PHYSICS 203 General Physics ² PHYSICS 204 General Physics ² BIOCHEM 507 General Physics ² PHYSICS 202 General Physics ² BIOCHEM 507 General Physics ² BIOCHEM 507 General Physics ² BIOCHEM 507 General Biochemistry BIOCHEM 507 Biochemistry BIOCHEM 507 Biochemistry BIOCHEM 507 Biochemistry BIOCHEM 500 Biochemistry <td>& BIOCORE 383</td> <td>Genetics Laboratory</td> <td></td> <td></td> <td>General Bioinformatics for</td>	& BIOCORE 383	Genetics Laboratory			General Bioinformatics for
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Biochemistry MICROBIO 657 Bioinformatics for Microbiologists BioChemistry MICROBIO 657 BioInformatics for Microbiologists BIOCHEM 501 Introduction to Biochemistry I BioChemistry I BIOCHEM 503 General Biochemistry II BioChemistry I BIOCHEM 508 General Biochemistry II BioChemistry II Microbiology Core: BIOCHEM 508 General Biochemistry II Complete all of the following courses (except where noted, all microbiology for corganisms 2 BIOCHEM 601 Protein and Enzyme Structure and Function MICROBIO 303 Biology of Microorganisms 2 BIOCHEM 601 Protein and Enzyme Structure and Function MICROBIO 304 Biology of Microorganisms 2 BOTANY 330 Algae MICROBIO 305 Critical Analyses in Microbiology and Evolution of Microorganisms (Spring only) BOTANY 332 MICROBIO 450 Diversity, Ecology and Evolution of Microorganisms (Spring only) So5 CHEM 665 Biophysical Chemistry MICROBIO 551 Capstone Research Project in Microbiology (Fall only) Poob Sci 1550 Faw Ecol_/SURG Diseases of Wildlife MICROBIO 551 Capstone Research Project in Microbiology (Epring only) Piochology Zogy So Mik 1301 Pathogenie Bacteriology		-			Microbial and Cellular Metabolomics
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MICROBIO/ Food Microbiology Laboratory M M & I/ Viruses		t not all elective courses are offered			Bioterrorism
MICROBIO/ Food Microbiology Laboratory PL PATH 640	Set A:		3-6	,	
		Food Microbiology Laboratory			viruses

Total Credita		64.00
M M & I 655		
GENETICS/		
BOTANY/		
PL PATH/	Biology and Genetics of Fungi	
PL PATH 622	Plant-Bacterial Interactions	
PATH-BIO/ M M & I 528	Immunology	

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/honorsprogram/). 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

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MATH 521	Analysis I	3	Quality of
MATH 522	Analysis II	3	Work
MATH 541	Modern Algebra	З	
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

BIOCORE

PHYSICS 249

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Code	Title	Credits
BIOCORE 486	Principles of Physiology Laboratory	2
BIOCORE 587	Biological Interactions	3

A Modern Introduction to Physics

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UNIVERSITY DEGREE REQUIREMENTS

Away programs.

Total DegreeTo 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.ResidencyDegree 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 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.