

BIOLOGY, B.S. (CALs)

The biology major is designed for students with broad interests in the biological sciences. It is intended primarily to:

1. prepare undergraduates for graduate studies in diverse areas of biology;
2. prepare certain pre-professional students (e.g., medicine, veterinary medicine, dentistry) for advanced study in the health professions;
3. provide a broad exposure to biology for students who want a general science education as biologists, and
4. serve as initial preparation for students who later choose a more specialized major.

The major is offered by the College of Agricultural and Life Sciences and the College of Letters & Science.

HOW TO GET IN

To declare this major, students must be admitted to UW–Madison and the College of Agricultural and Life Sciences (CALs). For information about becoming a CALs 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 under the Advising and Careers tab.

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/#requirementsforundergraduestudystext>) section of the *Guide*.

- | | |
|-------------------|--|
| General Education | <ul style="list-style-type: none"> • 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. Specific requirements for all majors in the college and other information on academic matters can be obtained from the Office of Academic Affairs (<http://www.cals.wisc.edu/academics>), College of Agricultural and Life Sciences, 116 Agricultural Hall, 1450 Linden Drive, Madison, WI 53706; 608-262-3003. Academic departments and advisors also have information on requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies and Science), 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

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/#requirementstext)	1
	International Studies (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext)	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/#requirementstext)		

MAJOR REQUIREMENTS

Courses may not double count within the major (unless specifically noted otherwise), but courses counted toward the major requirements may also be used to satisfy a university requirement and/or a college requirement. A minimum of 15 credits must be completed in the major that are not used elsewhere. Students must complete a minimum of 31 credits from Introductory Biology, Foundation, Intermediate/Advanced, Seminar (options only) and additional lab/research courses.

Students may complete the biology major requirements or select a Named Option (below).

BIOLOGY NAMED OPTIONS

Instead of completing the requirements above, students may choose to select one of the options below.

- Biology: Evolutionary Biology (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/bacteriology/biology-bs/biology-evolutionary-biology-bs>)
- Biology: Neurobiology (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/bacteriology/biology-bs/biology-neurobiology-bs>)
- Biology: Plant Biology (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/bacteriology/biology-bs/biology-plant-biology-bs>)

MAJOR REQUIREMENTS

Courses may not double count within the major (unless specifically noted otherwise), but courses counted toward the major requirements may also be used to satisfy a university requirement and/or a college requirement. A minimum of 15 credits must be completed in the major that are not used elsewhere. Students must complete a minimum of 31 credits from Introductory Biology, Foundation, Intermediate/Advanced, Seminar (options only) and additional lab/research courses.

Students may complete the biology major requirements or select a Named Option (below).

CORE REQUIREMENTS

Mathematics and Statistics

Code	Title	Credits
Select 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	
Select one of the following: ¹ 3-4		
MATH 222	Calculus and Analytic Geometry 2	
STAT 301	Introduction to Statistical Methods	
STAT 371	Introductory Applied Statistics for the Life Sciences	

¹ Students completing the Evolutionary Biology option are required to complete either STAT 301 Introduction to Statistical Methods or STAT 371 Introductory Applied Statistics for the Life Sciences .

Chemistry

Code	Title	Credits
General Chemistry		
Select 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		
CHEM 343	Introductory Organic Chemistry	3
CHEM 344	Introductory Organic Chemistry Laboratory	2
CHEM 345	Intermediate Organic Chemistry	3

Physics

Code	Title	Credits
1st semester Physics; select one of the following:		4-5
PHYSICS 103	General Physics	
PHYSICS 201	General Physics	
PHYSICS 207	General Physics	
2nd semester Physics, select one of the following:		4-5
PHYSICS 104	General Physics	
PHYSICS 202	General Physics	
PHYSICS 208	General Physics	

Introductory Biology

Code	Title	Credits
Select one of the following options: ¹		10-16
Option A:		
BIOLOGY/ BOTANY/ ZOOLOGY 151	Introductory Biology	
BIOLOGY/ BOTANY/ ZOOLOGY 152	Introductory Biology	
Option B:		
BIOCORE 381	Evolution, Ecology, and Genetics	
BIOCORE 382	Evolution, Ecology, and Genetics Laboratory	
BIOCORE 383	Cellular Biology	
BIOCORE 384	Cellular Biology Laboratory	
BIOCORE 485	Organismal Biology	
Option C:		
ZOOLOGY/ BIOLOGY 101	Animal Biology	
ZOOLOGY/ BIOLOGY 102	Animal Biology Laboratory	
BOTANY/ BIOLOGY 130	General Botany	

Foundational Course ²

Select one of the following:		3
BIOCORE 381 & BIOCORE 383	Evolution, Ecology, and Genetics and Cellular Biology ³	

AGRONOMY/ HORT 338	Plant Breeding and Biotechnology
GENETICS 466	Principles of Genetics
GENETICS 468	General Genetics 2
MICROBIO 470	Microbial Genetics & Molecular Machines
BIOCHEM 501	Introduction to Biochemistry
BIOCHEM 508	General Biochemistry II

¹ For AP Biology policy, as it applies to introductory biology in the biology major, see this link (<http://biologymajor.wisc.edu/advising/advisor-resources/ap-ib-biology-policy>).

² Does not count toward intermediate/advanced courses. Students completing the Evolutionary Biology option must complete either GENETICS 466 Principles of Genetics or GENETICS 468 General Genetics 2 to fulfill the Foundational requirement. Students completing the Plant Biology option are not allowed to take MICROBIO 470 Microbial Genetics & Molecular Machines to fulfill the Foundational requirement.

³ Students may use BIOCORE 381 Evolution, Ecology, and Genetics and BIOCORE 383 Cellular Biology to contribute to introductory biology and satisfy foundation.

INTERMEDIATE/ADVANCED COURSES

Minimum of 13 credits required and must include **one approved lab course**. Approved lab courses are indicated by footnote.

Select one course from categories A or B below.

Select one course from categories C or D below.

Select one course from category E or from an unused category above.

A. Cellular and Subcellular Biology

Code	Title	Credits
AGRONOMY/ HORT 338	Plant Breeding and Biotechnology	3
BOTANY/ AGRONOMY/ HORT 339	Plant Biotechnology: Principles and Techniques I ¹	4
AGRONOMY/ BOTANY/HORT 340	Plant Cell Culture and Genetic Engineering ¹	4
AN SCI/DY SCI 362	Veterinary Genetics	2
BIOCHEM 501	Introduction to Biochemistry	3
BIOCHEM 507	General Biochemistry I	3
BIOCHEM 508	General Biochemistry II	3-4
BIOCHEM/ NUTR SCI 510	Biochemical Principles of Human and Animal Nutrition	3
BIOCHEM 551	Biochemical Methods ¹	4
BIOCHEM/ M M & I 575	Biology of Viruses	2
BIOCHEM 601	Protein and Enzyme Structure and Function	2
BIOCHEM/ GENETICS/ MICROBIO 612	Prokaryotic Molecular Biology	3
BIOCHEM/ GENETICS/ MD GENET 620	Eukaryotic Molecular Biology	3

BIOCHEM/ BOTANY 621	Plant Biochemistry	3
BIOCHEM 625	Mechanisms of Action of Vitamins and Minerals	2
BIOCHEM/PHMCOL- M/ZOOLOGY 630	Cellular Signal Transduction Mechanisms	3
BMOLCHEM 314	Introduction to Human Biochemistry	3
BMOLCHEM 504	Human Biochemistry Laboratory ¹	3
BMOLCHEM/ MICROBIO 668	Microbiology at Atomic Resolution	3
BOTANY/ENTOM/ PL PATH 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	3
GENETICS 466	Principles of Genetics	3
GENETICS 467	General Genetics 1	3
GENETICS 520	Neurogenetics	2
GENETICS 527	Developmental Genetics for Conservation and Regeneration	3
GENETICS/ MD GENET/ ZOOLOGY 562	Human Cytogenetics	2
GENETICS/ MICROBIO 607	Advanced Microbial Genetics	3
MICROBIO 470	Microbial Genetics & Molecular Machines	3
MICROBIO/ SOIL SCI 523	Soil Microbiology and Biochemistry	3
MICROBIO/M M & I/ PATH-BIO 528	Immunology	3
MICROBIO 551	Capstone Research Project in Microbiology ¹	2
MICROBIO/ ONCOLOGY/ PL PATH 640	General Virology-Multiplication of Viruses	3
M M & I 341	Immunology	3
NEURODPT/NTP/ ZOOLOGY 616	Lab Course in Neurobiology and Behavior ¹	4
NTP/ NEURODPT 610	Cellular and Molecular Neuroscience	4
NTP/ NEURODPT 629	Molecular and Cellular Mechanisms of Memory	3
NTP 675	Special Topics (Stem Cell in Neurobiology)	1-3
NTP 675	Special Topics (Reproductive Neuroendocrinology)	1-3
NTP 675	Special Topics (Molecular Mechanisms of Brain Damage)	1-3
PHM SCI 558	Laboratory Techniques in Pharmacology and Toxicology ¹	2
NEURODPT 533	Molecular Physiology	2
PSYCH 601	Current Topics in Psychology (Epigenetics & the Brain) ²	3
ZOOLOGY 470	Introduction to Animal Development	3
ZOOLOGY/ PSYCH 523	Neurobiology	3

ZOOLOGY 555	Laboratory in Developmental Biology ¹	3
ZOOLOGY 570	Cell Biology	3
ZOOLOGY 604	Computer-based Gene and Disease/ Disorder Research Lab ¹	2
ZOOLOGY 625	Development of the Nervous System	2
ZOOLOGY 655	Modeling Neurodevelopmental Disease	3

¹ Courses also approved for lab credit

B. Organismal Biology

Code	Title	Credits
AN SCI/DY SCI 373	Animal Physiology	3
AN SCI/DY SCI 434	Reproductive Physiology ¹	3
AN SCI/F&W ECOL/ ZOOLOGY 520	Ornithology	3
AN SCI/F&W ECOL/ ZOOLOGY 521	Birds of Southern Wisconsin ¹	3
ANAT&PHY 335	Physiology ¹	5
ANAT&PHY 337	Human Anatomy	3
ANAT&PHY 338	Human Anatomy Laboratory ¹	2
ANAT&PHY 435	Fundamentals of Human Physiology ¹	5
ANTHRO/ NTP/PSYCH/ ZOOLOGY 619	Biology of Mind	3
BIOCORE 486	Organismal Biology Laboratory ¹	2
BOTANY 300	Plant Anatomy ¹	4
BOTANY 330	Algae ¹	3
BOTANY/ PL PATH 332	Fungi ¹	4
BOTANY/ F&W ECOL 402	Dendrology ¹	2
BOTANY 500	Plant Physiology ¹	3-4
CS&D 503	Neural Mechanisms of Speech, Hearing and Language	3
DY SCI 305	Lactation Physiology ¹	3
ENTOM/ ZOOLOGY 302	Introduction to Entomology ¹	4
ENTOM 321	Physiology of Insects	3
ENTOM 331	Taxonomy of Mature Insects ¹	4
F&W ECOL 401	Physiological Animal Ecology	3
GENETICS 545	Genetics Laboratory ¹	2
GENETICS/ MD GENET 565	Human Genetics	3
GEOSCI/ ZOOLOGY 542	Invertebrate Paleontology	3
KINES 314	Physiology of Exercise ¹	4
KINES 721	Neural Basis for Movement	3
MICROBIO 303	Biology of Microorganisms	3
MICROBIO 304	Biology of Microorganisms Laboratory ¹	2
MICROBIO 330	Host-Parasite Interactions	3

MICROBIO/ BIOLOGY 525	Advanced Biological Laboratory Practices: A Research Experience ¹	2
MICROBIO 526	Physiology of Microorganisms	3
M M & I 301	Pathogenic Bacteriology	2
M M & I/ENTOM/ PATH-BIO/ ZOOLOGY 350	Parasitology	3
M M & I 410	Medical Mycology	2
NTP/NEURODPT/ PSYCH 611	Systems Neuroscience	4
NTP/ZOOLOGY 620	Neuroethology Seminar	2
NTP/ NEURODPT 630	Neuronal Mechanisms for Sensation and Memory in Cerebral Cortex	3
NTP 675	Special Topics (Basic Sleep Mechanisms & Sleep Disorders)	1-3
NTP 675	Special Topics (Functional Brain Imaging of Cognitive Disorders)	1-3
NUTR SCI 431	Nutrition in the Life Span	3
NUTR SCI 631	Clinical Nutrition I	3
NUTR SCI/ PHM PRAC 672	Herbals, Homeopathy, and Dietary Supplements	2-3
ONCOLOGY 401	Introduction to Experimental Oncology	2
PATH 404	Pathophysiologic Principles of Human Diseases	3
PL PATH 558	Biology of Plant Pathogens ¹	3
PSYCH 406	Psychology of Perception	3-4
PSYCH 601	Current Topics in Psychology (Neural Basis of Cognitive Control)	3
PSYCH 414	Cognitive Psychology	3
PSYCH 454	Behavioral Neuroscience	3
PSYCH 513	Hormones, Brain, and Behavior	4
PSYCH 606	Hormones and Behavior	3
ZOOLOGY 303	Aquatic Invertebrate Biology	3
ZOOLOGY 400	Topics in Biology (Mammalogy)	1-3
ZOOLOGY 430	Comparative Anatomy of Vertebrates ¹	5
ZOOLOGY 603	Endocrinology	3-4
ZOOLOGY 611	Comparative and Evolutionary Physiology	3
ZOOLOGY 612	Comparative Physiology Laboratory ¹	2

¹ Courses also approved for lab credit

C. Ecology

Code	Title	Credits
AGRONOMY/ BOTANY/ SOIL SCI 370	Grassland Ecology	3
AGRONOMY/ ENTOM/F&W ECOL/ M&ENVTOX 632	Ecotoxicology: The Chemical Players	1

AGRONOMY/ ENTOM/F&W ECOL/ M&ENVTOX 633	Ecotoxicology: Impacts on Individuals	1
AGRONOMY/ ENTOM/F&W ECOL/ M&ENVTOX 634	Ecotoxicology: Impacts on Populations, Communities and Ecosystems	1
BOTANY/ ZOOLOGY 450	Midwestern Ecological Issues: A Case Study Approach	2
BOTANY/ F&W ECOL 455	The Vegetation of Wisconsin ¹	4
BOTANY 459		1-2
BOTANY/F&W ECOL/ ZOOLOGY 460	General Ecology ¹	4
BOTANY/ENTOM/ ZOOLOGY 473	Plant-Insect Interactions	3
BOTANY/ENVIR ST/ F&W ECOL/ ZOOLOGY 651	Conservation Biology	3
ENTOM 450	Basic and Applied Insect Ecology	3
ENTOM 451	Basic and Applied Insect Ecology Laboratory	1
ENVIR ST/ ZOOLOGY 315	Limnology-Conservation of Aquatic Resources	2
ENVIR ST/ LAND ARC 361	Wetlands Ecology	3
F&W ECOL 379	Principles of Wildlife Management	3
F&W ECOL 550	Forest Ecology	3
F&W ECOL/ LAND ARC/ ZOOLOGY 565	Principles of Landscape Ecology	2
F&W ECOL/ ZOOLOGY 660	Climate Change Ecology	3
MICROBIO/AN SCI/ BOTANY 335	The Microbiome of Plants, Animals, and Humans	3
PL PATH 300	Introduction to Plant Pathology ¹	4
PL PATH 315	Plant Microbiomes ¹	4
ZOOLOGY 316	Laboratory for Limnology- Conservation of Aquatic Resources ¹	2-3
ZOOLOGY 504	Modeling Animal Landscapes	3-5
ZOOLOGY/ ENVIR ST 510	Ecology of Fishes	3
ZOOLOGY/ ENVIR ST 511	Ecology of Fishes Lab ¹	2

¹ Courses also approved for lab credit

D. Evolution and Systematics

Code	Title	Credits
ANTHRO 302	Hominoid Evolution	3
ANTHRO 304	Heredity, Environment and Human Populations	3
ANTHRO/BOTANY/ ZOOLOGY 410	Evolutionary Biology	3
ANTHRO 411	The Evolution of the Genus, Homo	3
ANTHRO 458	Primate Behavioral Ecology	3
ANTHRO 603	Seminar in Evolutionary Theory	3

ANTHRO 658	Ecological Models of Behavior	3
BOTANY 305	Plant Morphology and Evolution ¹	4
BOTANY 400	Plant Systematics ¹	4
BOTANY 401	Vascular Flora of Wisconsin ¹	4
BOTANY 422	Plant Geography	3
BOTANY 563	Phylogenetic Analysis of Molecular Data	3
ENTOM 432	Taxonomy and Bionomics of Immature Insects ¹	4
ENTOM/GENETICS/ ZOOLOGY 624	Molecular Ecology	3
ENVIR ST/ F&W ECOL/ ZOOLOGY 360	Extinction of Species	3
GENETICS 468	General Genetics 2	3
GEOSCI/ ZOOLOGY 541	Paleobiology	3
MICROBIO 450	Diversity, Ecology and Evolution of Microorganisms	3
PSYCH 449	Animal Behavior	3
PSYCH 450	Primates and Us: Insights into Human Biology and Behavior	3
PSYCH/ ZOOLOGY 550	Animal Communication and the Origins of Language	3
ZOOLOGY 300	Invertebrate Biology and Evolution	3
ZOOLOGY 301	Invertebrate Biology and Evolution Lab ¹	2
ZOOLOGY 425	Behavioral Ecology	3

¹ Courses also approved for lab credit

E. Applied Biology, Agriculture and Natural Resources

Code	Title	Credits
A A E/AGRONOMY/ INTER-AG/ NUTR SCI 350	World Hunger and Malnutrition	3
AGRONOMY 300	Cropping Systems	3
AGRONOMY 302	Forage Management and Utilization	3
AGRONOMY/ HORT 360	Genetically Modified Crops: Science, Regulation & Controversy	2
AGRONOMY 377	Cropping Systems of the Tropics	3
AGRONOMY/ HORT 501	Principles of Plant Breeding	3
AMER IND/ANTHRO/ BOTANY 474	Ethnobotany	3-4
AN SCI/DY SCI/ NUTR SCI 311	Comparative Animal Nutrition	3
AN SCI/DY SCI 313	Animal Feeds and Diet Formulation	1
AN SCI/DY SCI 320	Animal Health and Disease Management	3
AN SCI/DY SCI 361	Introduction to Animal and Veterinary Genetics	2
AN SCI/DY SCI 363	Principles of Animal Breeding	2
AN SCI 503	Avian Physiology ¹	3
AN SCI 512	Management for Avian Health ¹	3
BIOCORE 587	Biological Interactions	3

BIOLOGY/ GENETICS 522	Evolution Seminar Series- Undergraduate	1
BOTANY 403	Field Collections and Identification	1-4
DY SCI/INTER- AG 471	Food Production Systems and Sustainability	3
ENTOM 351	Principles of Economic Entomology	3
ENTOM/ ZOOLOGY 371	Medical Entomology ¹	3
ENTOM/ F&W ECOL 500	Insects in Forest Ecosystem Function and Management	2
ENVIR ST/ POP HLTH 471	Introduction to Environmental Health	3
ENVIR ST/ POP HLTH 502	Air Pollution and Human Health	3
F&W ECOL 306	Terrestrial Vertebrates: Life History and Ecology ¹	4
F&W ECOL/ HORT/LAND ARC/ PL PATH 309	Diseases of Trees and Shrubs	3
F&W ECOL 318	Principles of Wildlife Ecology	3
F&W ECOL/ ZOOLOGY 335	Human/Animal Relationships: Biological and Philosophical Issues	3
F&W ECOL 410	Principles of Silviculture	3
F&W ECOL 415	Tree Physiology	3
F&W ECOL/ SURG SCI 548	Diseases of Wildlife	3
F&W ECOL 561	Wildlife Management Techniques ¹	3
FOOD SCI/ MICROBIO 324	Food Microbiology Laboratory ¹	2
FOOD SCI/ MICROBIO 325	Food Microbiology	3
FOOD SCI 532	Integrated Food Manufacturing ¹	4
GENETICS 548	The Genomic Revolution	3
GENETICS/ HORT 550	Molecular Approaches for Potential Crop Improvement	3
HORT/ LAND ARC 263	Landscape Plants I ¹	3
HORT 370	World Vegetable Crops	3
HORT 372	Colloquium in Organic Agriculture	1
HORT 376	Tropical Horticultural Systems	1
HORT 378	Tropical Horticultural Systems International Field Study	2
HORT/PATH-BIO 500	Molecular Biology Techniques ¹	3
MEDICINE/ M&ENVTX/ ONCOLOGY/ PHM SCI/PHMCOL- M/POP HLTH 625	Toxicology I	3
M M & I 554	Emerging Infectious Diseases and Bioterrorism	2
MICROBIO/ SOIL SCI 425	Environmental Microbiology	3
NTP/MED PHYS 651	Methods for Neuroimaging Research ¹	3
NUTR SCI 332	Human Nutritional Needs	3

PL PATH/ SOIL SCI 323	Soil Biology	3
PL PATH 517	Plant Disease Resistance	2-3
SOIL SCI 321	Soils and Environmental Chemistry	3
ZOOLOGY 500	Undergraduate Neurobiology Seminar	1

¹ Courses also approved for lab credit

CAPSTONE REQUIREMENT

Code	Title	Credits
------	-------	---------

Two credits minimum required. With advisor approval, directed study or research-based senior thesis in a biological science discipline can also count. The experience must be completed after the first year of an introductory biology sequence above. The capstone experience will normally be completed during the student's final two or three semesters. Also, a subset of laboratory courses has been approved for capstone. The following courses, along with 682s and 692s in biological science departments (taken senior year), can be accepted as fulfilling the capstone experience.

ANAT&PHY 435	Fundamentals of Human Physiology	5
BIOCORE 486	Organismal Biology Laboratory ¹	2
BMOLCHEM 504	Human Biochemistry Laboratory	3
BOTANY/ F&W ECOL 455	The Vegetation of Wisconsin	4
BOTANY/F&W ECOL/ ZOOLOGY 460	General Ecology (taken fall 2016 - summer 2020)	4
BOTANY/ LAND ARC 670	Adaptive Restoration Lab	2
ENVIR ST/ ZOOLOGY 511	Ecology of Fishes Lab (taken fall 2016 - summer 2020)	2
F&W ECOL 599	Wildlife Research Capstone (limited access)	3
GENETICS 527	Developmental Genetics for Conservation and Regeneration	3
MICROBIO 551	Capstone Research Project in Microbiology	2
PL PATH 315	Plant Microbiomes	4
ZOOLOGY 316	Laboratory for Limnology- Conservation of Aquatic Resources	2-3
ZOOLOGY 555	Laboratory in Developmental Biology	3

¹ To count BIOCORE 486 Organismal Biology Laboratory for capstone, students must also complete BIOCORE 382 Evolution, Ecology, and Genetics Laboratory and BIOCORE 384 Cellular Biology Laboratory.

BIOLOGY NAMED OPTIONS

Instead of completing the requirements above, students may choose to select one of the options below.

- Biology: Evolutionary Biology (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/bacteriology/biology-bs/biology-evolutionary-biology-bs>)

- Biology: Neurobiology (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/bacteriology/biology-bs/biology-neurobiology-bs>)
- Biology: Plant Biology (<http://guide.wisc.edu/undergraduate/agricultural-life-sciences/bacteriology/biology-bs/biology-plant-biology-bs>)

HONORS IN THE MAJOR

Admission to the Honors Program is not competitive provided students meet the required admission criteria.

Admission Criteria for New Freshmen:

- In the upper 10% of their high school graduating class
- ACT score of 28 or higher
- SAT score of at least 1240

Admission Criteria for Transfer and Continuing UW-Madison Students:

- UW-Madison cumulative GPA of at least 3.25

Highly motivated students can apply for admission to the program in the absence of these requirements by including a letter with their application addressed to the Honors Dean in 116 Agricultural Hall explaining why they should be in the program.

HOW TO APPLY

Apply to the program online (https://cals.wisc.edu/wp-content/uploads/2017/05/honorsapplication_form.pdf) or pick up an application in the Office of Academic Affairs, 116 Agricultural Hall. Applications are accepted at any time.

New freshmen 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 meeting with the advisor for that major by completing the application form and selecting Honors in the Major. Transfer and continuing students may apply directly to Honors in Research or Honors in the Major (after meeting with the major advisor).

HOW TO CANCEL PARTICIPATION

Students who are no longer interested in pursuing Honors should complete the form to cancel their participation. Students may cancel their participation at any time, and this will not be noted on the student's transcript.

REQUIREMENTS

To earn Honors in the Major, students are required to take at least 20 honors credits. In addition, students must take BIOLOGY 681 Senior Honors Thesis and BIOLOGY 682 Senior Honors Thesis when completing their thesis project; please see the Honors in Major Checklist (<http://www.cals.wisc.edu/academics/undergraduate-programs/get-involved/honors-program/honors-in-the-major>) for more information.

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

1. Know and understand core concepts that unify the breadth of biological sciences including: evolution; structure and function; information flow, exchange, and storage; pathways for transformations of energy and matter; and systems.
2. Demonstrate practical skills of a professional biologist including: problem-solving by engaging the process of science; written and verbal proficiency; laboratory skills; quantitative analysis skills; and teamwork skills.
3. Graduates will be able to engage and make broader connections to other scientific disciplines and society.

FOUR-YEAR PLAN

Four-year road maps for the biology major are designed to support biological science major exploration. The road map is a tool to assist you and your advisor in planning your academic career. Use it along with your DARS report and the Course Guide/Schedule of Classes. Your specific program of study could, and probably will, look different. You should customize the road map to fit your unique path at UW–Madison. Consult with your advisor about the best path for you.

FOUR-YEAR PLAN

SAMPLE BIOLOGY MAJOR—NO OPTION FOUR-YEAR PLAN

Freshman

Fall	Credits Spring	Credits
CHEM 103 or 109	4-5 CHEM 104	5
Math Course ¹	3-5 Math Course	3-5
COMM A or Breadth Courses	6 COMM A or Breadth Courses	5-7
First Year Seminar ²	1	
	14-17	13-17

Total Credits 27-34

Sophomore

Fall	Credits Spring	Credits
CHEM 343	3 CHEM 344	2
Math Course (if needed)	3-5 CHEM 345	3
Intro Biology Courses ³	3-5 Intro Biology Courses ³	3-5

Breadth Course	3 Breadth Courses	4-6
	12-16	12-16

Total Credits 24-32

Junior

Fall	Credits Spring	Credits
Physics Course	4-5 Physics Course	4-5
Foundational or Biocore	3 Biocore or Intermediate/ Advanced Biology Courses ⁴	3-5
Elective Courses	5-8 Elective Courses	5-8
	12-16	12-18

Total Credits 24-34

Senior

Fall	Credits Spring	Credits
Intermediate/Advanced Biology Course ⁴	3-5 Intermediate/Advanced Biology Course ⁴	3-5
Capstone or Research Course	2-3 Capstone or Research Course	2-3
Elective Courses	7-10 Elective Courses	7-10
	12-18	12-18

Total Credits 24-36

¹ Math determined by placement scores. Biology majors must complete MATH 171/MATH 217 or MATH 221 plus one additional math/stats course.

² Suggested that CALS freshmen investigate INTER-AG 155: Issues in Agriculture, Environment and Life Sciences; BIOLOGY 375 Special Topics: Exploring Biology; or a FIG.

³ Students may complete BIOLOGY/BOTANY/ZOOLOGY 151-BIOLOGY/BOTANY/ZOOLOGY 152 & a foundational course or BIOLOGY/ZOOLOGY 101-BIOLOGY/ZOOLOGY 102, BIOLOGY/BOTANY 130 & a foundational course or BIOCORE (three lectures and two labs required).

⁴ See Requirements tab for intermediate/advanced biology course lists.

SAMPLE BIOLOGY FOUR-YEAR PLAN—EVOLUTIONARY BIOLOGY OPTION**Freshman**

Fall	Credits Spring	Credits
CHEM 103 or 109	4-5 CHEM 104	5
Math Courses ¹	3-5 Math Courses	3-5
COMM A or Breadth Courses	6 COMM A or Breadth Courses	5-7
First Year Seminar ²	1	
	14-17	13-17

Total Credits 27-34

Sophomore

Fall	Credits Spring	Credits
CHEM 343	3 CHEM 345	3
Math Course (if needed)	3-5 CHEM 344	2
Intro Biology Course ³	3-5 Intro Biology Course ³	3-5

Breadth Course	3 Breadth Courses	4-6
	12-16	12-16

Total Credits 24-32

Junior

Fall	Credits Spring	Credits
Physics Course	4-5 Physics Course	4-5
Foundational or Biocore	3-5 Biocore or Intermediate/ Advanced Biology ⁴	3-5
Electives	5 ANTHRO/BOTANY/ ZOOLOGY 410	3
	Evolution Seminar	1
	Electives	4
	12-15	15-18

Total Credits 27-33

Senior

Fall	Credits Spring	Credits
Intermediate/Advanced Biology Course ⁴	5 Intermediate/Advanced Biology Course ⁴	5
Capstone or Research Course	2-3 Capstone or Research Course	2-3
Elective Courses	5-8 Elective Courses	5-8
	12-16	12-16

Total Credits 24-32

¹ Math determined by placement scores. Biology majors must complete MATH 171/MATH 217 or MATH 221 plus one additional math/stats course.

² Suggested that CALS freshmen investigate INTER-AG 155: Issues in Agriculture, Environment and Life Sciences; BIOLOGY 375 Special Topics: Exploring Biology; or a FIG.

³ Students may complete BIOLOGY/BOTANY/ZOOLOGY 151-BIOLOGY/BOTANY/ZOOLOGY 152 & a foundational course or BIOLOGY/ZOOLOGY 101-BIOLOGY/ZOOLOGY 102, BIOLOGY/BOTANY 130 & a foundational course or BIOCORE (three lectures and two labs required).

⁴ See Requirements tab for intermediate/advanced biology course lists.

SAMPLE BIOLOGY FOUR-YEAR PLAN—PLANT BIOLOGY OPTION**Freshman**

Fall	Credits Spring	Credits
CHEM 103 or 109	4-5 CHEM 104	5
Math ¹	3-5 Stats/ Math	3-5
COMM A or Breadth Courses	6 COMM A or Breadth Courses	5-7
First Year Seminar ²	1	
	14-17	13-17

Total Credits 27-34

Sophomore

Fall	Credits Spring	Credits
CHEM 343	3 CHEM 345	3
Stats / Math (if needed)	3-5 CHEM 344	2

Intro Biology Course ³	3-5 Intro Biology Course ³	3-5
Breadth Course	3 Breadth Course	4-6
	12-16	12-16

Total Credits 24-32

Junior		
Fall	Credits Spring	Credits
Physics	4-5 Physics	4-5
Foundational or Biocore	3-5 Biocore or Intermediate/ Advanced Plant Biology ⁴	3-5
Electives	5-8 Plant Science Seminar	1
	Electives	5-7
	12-18	13-18

Total Credits 25-36

Senior		
Fall	Credits Spring	Credits
Intermediate/Advanced Plant Biology ⁴	5 Intermediate/Advanced Plant Biology ⁴	5
Capstone or Research	2-3 Capstone or Research	2-3
Plant Science Seminar (if needed)	1 Plant Science Seminar (if needed)	1
Electives	5-8 Electives	5-8
	13-17	13-17

Total Credits 26-34

¹ Math determined by placement scores. Biology majors must complete MATH 171/MATH 217 or MATH 221 plus one additional math/stats course. **Stats recommended.**

² Suggested that CALS freshmen investigate INTER-AG 155: Issues in Agriculture, Environment and Life Sciences; BIOLOGY 375 Special Topics: Exploring Biology; or a FIG.

³ Students may complete BIOLOGY/BOTANY/ZOOLOGY 151-BIOLOGY/BOTANY/ZOOLOGY 152 & a foundational course or (**recommended**) BIOLOGY/ZOOLOGY 101-BIOLOGY/ZOOLOGY 102, BIOLOGY/BOTANY 130 & a foundational course or BIOCORE (three lectures and two labs required).

⁴ See Requirements tab for intermediate/advanced biology course lists.

ADVISING AND CAREERS

ADVISING

Your advisor is here to guide you through the biology major. We can address your questions and concerns, provide advice, help you create a four-year degree plan that meets your major and professional goals, and connect you to resources. It is important to remember that advising is about the process, and some questions do not have a quick and easy answer. Your advisor will challenge you to self-reflect, to critically think about your goals and strategies, and to develop decision-making skills. For more information about what to expect during your advising appointment, visit UW Undergraduate Advising (<http://advising.wisc.edu/content/expectations-about-advising>).

In the biology major, students are assigned to an advisor according to last name. Please schedule an advising appointment here (<http://biologymajor.wisc.edu/advising>).

CAREERS

The biology major encourages students to begin working on their career exploration and preparation soon after arriving on campus. We partner with the CALS Career Services office to help you leverage the academic skills learned in your major and liberal arts degree, explore and try out different career paths, participate in internships, prepare for the job search and/or graduate school applications, and network with professionals in the field (alumni and employers).

College of Agricultural and Life Sciences graduates are in high demand by employers and graduate programs. It is important to us that our students are career ready at the time of graduation, and we are committed to your success.

Career Resources:

- Schedule a Career Advising appointment (<https://cals.wisc.edu/academics/undergraduate-students/career-services/students>)
- Explore CALS Career Services for Students (<https://cals.wisc.edu/academics/undergraduate-students/career-services/resources>)

PEOPLE

ADVISING LEADERSHIP AND STAFF

Asen, Brian
Haas-Gallo, Erica
Kuba, Sarah, Program Manager
Magrady, Brittany

BIOLOGY MAJOR PROGRAM COMMITTEE

Fernandez, Donna, L&S Co-Chair
Yu, Jae-Hyuk, CALS Co-Chair
Baum, David, Evolutionary Biology Option Representative
Auger, Catherine, Neurobiology Option Representative
Goldman, Irwin, Plant Biology Option Representative
Bent, Andrew
Blair, Seth
Boekhoff-Falk, Grace
Harris, Michelle
Senes, Alessandro
Kuba, Sarah, ex officio
Kurtz, Robin, ex officio
Thoma, Sharon, ex officio

WISCONSIN EXPERIENCE

The following opportunities can help students connect with other students interested in biology, build relationships with faculty and staff, and contribute to out-of-classroom learning:

- Beta Beta Beta Biological Honor Society (<https://win.wisc.edu/organization/tribeta>) is an honor and professional organization for undergraduate students in the biological sciences. Its activities are designed to stimulate interest, scholarly attainment, and investigation in the biological sciences, and to promote the dissemination of information and new interpretations among students in life sciences.

The society offers its members the unique opportunity to publish their undergraduate work in the pages of its journal, BIOS.

- Biology majors have the opportunity to go on experiential study abroad programs, where students can immerse themselves in research or global health field experiences. Students can review the Biology Major Advising Page (https://www.studyabroad.wisc.edu/map_biology.asp) on the International Academic Programs website for information on these and other programs, as well as requirements that can typically be fulfilled abroad and things to consider when incorporating study abroad into an academic plan.
- Students are encouraged to get involved in research in any life science department. Research can be performed for either course credit or pay, depending on the opportunity. Research opportunities can be identified by inquiring directly with faculty members, reading the Biology Major Newsletter, or announcement on the Student Job Center (<https://jobcenter.wisc.edu>).