BOTANY, BS

The Department of Botany provides an introduction to the living world: the diversity of its organisms; its historical origins through evolution; its principles of structure, function, and ecology; and its interactions, relationships, and effects on the nonliving world. Botany is the science of plants, algae, fungi, and bacteria—all living organisms except animals. Green plants and algae provide the photosynthetic energy for fueling all other life on earth and drive global water and carbon cycles. Fungi and bacteria are the fundamental recyclers of the earth.

The study of botany provides a broad background in the principles of modern biology and gives a solid foundation for careers in environmental studies, conservation biology, ecology, systematics, evolution, genetics, physiology, biotechnology, agriculture, and horticulture. Jobs requiring such preparation include teaching in secondary schools and colleges, research and development in industry and medicine, stewardship of our natural world through private and governmental programs, and research and teaching in academia.

HOW TO GET IN

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Prospective Botany majors should consult with the general undergraduate botany advisor by the beginning of the junior year to outline a course of study appropriate to the student's needs. Major Declaration may occur by meeting with the undergraduate advisor in the major.

To be accepted as a major in Botany, a student must have a grade point average of 2.500 for all science courses taken prior to declaration.

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 (https://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 LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (BS)

Students pursuing a Bachelor of Science degree in the College of Letters & Science must complete all of the requirements below. The College of Letters & Science allows this major to be paired with either the Bachelor of Arts or the Bachelor of Science degree requirements.

BACHELOR OF SCIENCE DEGREE REQUIREMENTS

Mathematics	Complete two courses of 3+ credits at the Intermediate or Advanced level in MATH, COMP SCI, or STAT subjects. A maximum of one course in each of COMP SCI and STAT subjects counts toward this requirement.
Language	Complete the third unit of a language other than English.
L&S Breadth	Complete: • 12 credits of Humanities, which must include at least 6 credits of Literature; and • 12 credits of Social Science; and • 12 credits of Natural Science, which must include 6 credits of Biological Science and 6 credits of Physical Science.
Liberal Arts and Science Coursework	Complete at least 108 credits.
Depth of Intermediate/Advanced Coursework	Complete at least 60 credits at the Intermediate or Advanced level.
Major	Declare and complete at least one major.
Total Credits	Complete at least 120 credits.
UW-Madison Experience	Complete both: • 30 credits in residence, overall, and • 30 credits in residence after the 86th credit.
Quality of Work	• 2.000 in all coursework at UW–Madison • 2.000 in Intermediate/Advanced level coursework at UW–Madison

NON–L&S STUDENTS PURSUING AN L&S MAJOR

Non–L&S students who have permission from their school/college to pursue an additional major within L&S only need to fulfill the major requirements. They do not need to complete the L&S Degree Requirements above.

REQUIREMENTS FOR THE MAJOR

MATH, CHEMISTRY, AND PHYSICS

Code	Title	Credits
Statistics/Mathematics (One course from the following): [1]		**3**
STAT 301	Introduction to Statistical Methods	
STAT 324	Introduction to Statistics for Science and Engineering	
STAT 371	Introductory Applied Statistics for the Life Sciences	
General Chemistry (One of the following):		**5-9**
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
CHEM 115 & CHEM 116	Chemical Principles I and Chemical Principles II	
CHEM 109	Advanced General Chemistry	
Organic Chemistry [2]		**3**
CHEM 341	Elementary Organic Chemistry	
or CHEM 343	Organic Chemistry I	
Physics (One course from the following): [3]		**3-5**
PHYSICS 115	Energy and Climate (preferred)	
PHYSICS 103	General Physics	
PHYSICS 104	General Physics	
PHYSICS 201	General Physics	
PHYSICS 202	General Physics	
PHYSICS 207	General Physics	
PHYSICS 208	General Physics	
PHYSICS 247	A Modern Introduction to Physics	
PHYSICS 248	A Modern Introduction to Physics	
PHYSICS 249	A Modern Introduction to Physics	
Total Credits		**14-20**

BIOLOGY AND BOTANY REQUIREMENTS

30 credits from:

Code	Title	Credits
Introductory Biology (Complete one option):		**5-10**
Option A, Recommended		
BOTANY/ BIOLOGY 130	General Botany [4]	
Option B: Introductory Biology		
BOTANY/ BIOLOGY/ ZOOLOGY 151	Introductory Biology	
BOTANY/ BIOLOGY/ ZOOLOGY 152	Introductory Biology	
Option C: BIOCORE		
BIOCORE 381	Evolution, Ecology, and Genetics	
BIOCORE 382	Evolution, Ecology, and Genetics Laboratory	
BIOCORE 383	Cellular Biology	
BIOCORE 384	Cellular Biology Laboratory	
BIOCORE 485	Principles of Physiology	

Code	Title	Credits
Botany Distribution - Five courses, to include at least one course in these areas:		**15**
Cell, Molecular, Physiology (1 course required):		
BOTANY 300	Plant Anatomy	
or BOTANY 500	Plant Physiology	
Ecology (1 course required):		
BOTANY 455	The Vegetation of Wisconsin	
or BOTANY/ F&W ECOL/ ZOOLOGY 460	General Ecology	
Genetics, Evolution (1 course required): [5]		
BOTANY/ ANTHRO/ ZOOLOGY 410	Evolutionary Biology	
GENETICS 466	Principles of Genetics [2]	
PLANTSCI 338	Plant Breeding and Biotechnology	
GENETICS 467	General Genetics 1	
GENETICS 468	General Genetics 2	
Diversity (1 course required)		
BOTANY 305	Plant Morphology and Evolution	
BOTANY 330	Algae	
BOTANY/ PL PATH 332	Fungi	
BOTANY 400	Plant Systematics	
BOTANY 401	Vascular Flora of Wisconsin	
Optionally, 1 of the 5 required courses may come from this list, or students may take a second course from any area listed above:		
BOTANY/ GEOG 338	Environmental Biogeography	
BOTANY/ F&W ECOL 402	Dendrology: Woody Plant Identification and Ecology	
BOTANY 403	Field Collections and Identification	
BOTANY 422	Plant Geography	
BOTANY/ ZOOLOGY 450	Midwestern Ecological Issues: A Case Study Approach	
BOTANY/ ENTOM/ ZOOLOGY 473	Plant-Insect Interactions	
BOTANY/ AMER IND/ ANTHRO 474	Ethnobotany	
BOTANY/ ENTOM/ PL PATH 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	

BOTANY/ ENVIR ST/ F&W ECOL/ ZOOLOGY 516	Conservation Biology
BOTANY/ PL PATH 563	Phylogenetic Analysis of Molecular Data
BOTANY/ BIOCHEM 621	Plant Biochemistry
AGROECOL 370	Grassland Ecology
BIOCHEM 501	Introduction to Biochemistry
BIOCORE 486	Principles of Physiology Laboratory
BIOCORE 587	Biological Interactions
MICROBIO 303	Biology of Microorganisms
ZOOLOGY 570	Cell Biology

Code	Title	Credits
Independent Research Experience—choose one: [6]		**3-6**
BOTANY 691 & BOTANY 692	Senior Thesis and Senior Thesis	4
BOTANY 681 & BOTANY 682	Senior Honors Thesis and Senior Honors Thesis	6
BOTANY 699	Directed Study	3-4

RESIDENCE AND QUALITY OF WORK

- 2.000 GPA in all BOTANY and major courses
- 2.000 GPA on 15 upper-level major credits, taken in residence[7]
- 15 credits in BOTANY, taken on the UW–Madison campus

HONORS IN THE MAJOR

Students may declare Honors in the Botany Major in consultation with the Botany undergraduate advisor.

HONORS IN THE MAJOR IN BOTANY: REQUIREMENTS

To earn Honors in the Major in Botany, students must satisfy the requirements for the major (above) and the following additional requirements:

- 3.300 University GPA
- 3.400 GPA in all BOTANY and major courses
- Complete 12 Honors credits from coursework listed in the "Botany Distribution" requirements[8] or from Intermediate/Advanced Honors coursework in Biocore
- Conduct Senior Honors Thesis research in BOTANY 681 & BOTANY 682 for a total of 6 credits

FOOTNOTES

[1] STAT 371, MATH 211, or MATH 221 are strongly recommended for students preparing for graduate school, as these usually are required for entry into post-undergraduate programs.

[2] CHEM 341 is the best option for organic chemistry if only one course is to be taken. However, for students who are preparing for graduate school, the three-course organic chemistry sequence (CHEM 343, CHEM 344, & CHEM 345) is strongly recommended instead of CHEM 341, as some graduate programs may require a sequence of organic chemistry courses.

[3] PHYSICS 115 is the best choice if one course is to be taken. It is recommended that two semesters of PHYSICS be taken (PHYSICS 103-PHYSICS 104 or PHYSICS 201-PHYSICS 202 or PHYSICS 207-PHYSICS 208).

[4] In addition to BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY 101 and/ or ZOOLOGY/BIOLOGY 102 will count towards 30 credits of Botany major.

[5] Completion of the BIOCORE sequence also satisfies the Genetics, Evolution area (BIOCORE 381 & BIOCORE 382 & BIOCORE 383 & BIOCORE 384 & BIOCORE 48

[6] Students nearing completion of the major should seek out research opportunities with their advisor or faculty supervisor, and register for their project at the end of the junior year.

[7] BOTANY 300–BOTANY 699 are considered upper-level in the major.

[8] Excluding BOTANY 681 and BOTANY 682.

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

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1. Acquire and demonstrate foundational understanding of the basic properties of plant life from the subcellular to the ecosystem level of organization.
2. Acquire and demonstrate basic understanding in chemistry, physics, and mathematics to interpret biological phenomena.
3. Acquire and demonstrate detailed knowledge in at least five of these core areas of plant biology: Genetics, Physiology, Structural biology, Ecology, Systematics, Evolution, Cryptogamic biology.
4. Explore these core areas in the context of the laboratory and/or the field.
5. Engage in plant biology research (to include algae, photosynthetic bacteria, and fungi): develop hypotheses, acquire scientific information, and interpret results in the context of the historical scientific literature in one or more specialized botanical subdisciplines.

6. Develop an appreciation of communicating scientific information, especially in written form.

FOUR-YEAR PLAN

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This Four-Year Plan is only one way a student may complete an L&S degree with this major. Many factors can affect student degree planning, including placement scores, credit for transferred courses, credits earned by examination, and individual scholarly interests. In addition, many students have commitments (e.g., athletics, honors, research, student organizations, study abroad, work and volunteer experiences) that necessitate they adjust their plans accordingly. Informed students engage in their own unique Wisconsin Experience by consulting their academic advisors, Guide, DARS, and Course Search & Enroll for assistance making and adjusting their plan.

This plan shown focuses on completing major requirements early enough to be able to pursue advanced interests later. It also includes additional research experiences beyond the minimum, since many students find it helpful to begin research earlier than their senior year. Students interested in graduate school would be advised to take additional courses in the biological, physical, and/or data science fields. Students seeking honors in the Major might want to consult the sample 4-year plans provided by the Biocore (https://guide.wisc.edu/undergraduate/letters-science/biology-core-curriculum/biology-core-curriculum-honors-certificate/) program

First Year

Fall	Credits	Spring	Credits
General chemistry (choose one)[1]	4-5	CHEM 104 (or Elective)	5
CHEM 103 or 109[1]		Introductory Biology First Semester (choose one)	5
Communications A (complete during your first year)	3	BOTANY/ BIOLOGY 130 or BIOLOGY 151	
MATH 221[2]	5	Humanities Breadth	3
Language Requirement Course	3-4	Social Science Breadth	3
	15		**16**

Second Year

Fall	Credits	Spring	Credits
CHEM 341[3]	3	PHYSICS 115	3
Introductory Biology First Semester (choose one)	5	STAT 371	3
BIOLOGY/ ZOOLOGY 101 & BIOLOGY/ ZOOLOGY 102		BOTANY/AMER IND/ ANTHRO 474 (or an alternate Ethnic Studies course)	3-4
BIOLOGY/BOTANY/ ZOOLOGY 152		Botany Breadth (I/A)	4
Comm B (if not taking BIOLOGY 152) or Elective	3-4		
Social Science Breadth	3		
	15		**14**

Third Year

Fall	Credits	Spring	Credits
BOTANY 499 (or Botany Breadth (I/A))	1-3	Botany Breadth (I/A) Course(s) or Elective(s)	9
Botany Breadth (I/A) Courses	6-7	Literature Breadth (I/A)	3
Humanities Breadth	3	I/A COMP SCI/MATH/ STAT Course (not needed if MATH 221 and STAT 371 taken)	3
Social Science Breadth	3		
	15		**15**

Fourth Year

Fall	Credits	Spring	Credits
BOTANY 691	2-3	BOTANY 692	3
Botany Breadth (I/A) Course(s) or Elective(s)	9	Botany Breadth (I/A) Course(s) or Elective(s)	12
Literature Breadth	3		
	15		**15**

Total Credits 120

1 Chemistry sequence CHEM 103 & CHEM 104 recommended.
2 Or a different course in mathematics guided by placement testing.
3 Organic Chemistry full sequence (CHEM 343, CHEM 344, & CHEM 345) recommended, especially for students interested in molecular biology or biochemistry

ADVISING AND CAREERS

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Students can find information about declaring the major at declaration and advising (https://botany.wisc.edu/undergraduate-study/declaration-and-advising/).

SUCCESSWORKS

SuccessWorks (https://successworks.wisc.edu/) at the College of Letters & Science helps you turn the academic skills learned in your classes into a fulfilling life, guiding you every step of the way to securing jobs, internships, or admission to graduate school.

Through one-on-one career advising, events, and resources, you can explore career options, build valuable internship and research experience, and connect with supportive alumni and employers who open doors of opportunity.

- What you can do with your major (https://successworks.wisc.edu/what-you-can-do-with-your-major/) (Major Skills & Outcomes Sheets)
- Make a career advising appointment (https://successworks.wisc.edu/make-an-appointment/)
- Learn about internships and internship funding (https://successworks.wisc.edu/finding-a-job-or-internship/)

- Try “Jobs, Internships, & How to Get Them,” (https://successworks.wisc.edu/canvas/) an interactive guide in Canvas for enrolled UW–Madison students