**BOTANY, B.S.**

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**

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 2.5 for all science courses taken during the freshman and sophomore years.

**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.

**COLLEGE OF LETTERS & SCIENCE**

**BREADTH AND DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (B.S.)**

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 a bachelor of arts or a bachelor of science curriculum. View a comparison of the degree requirements here. (https://pubs.wisc.edu/home/archives/ug15/images/babs2009.pdf)

**BACHELOR OF SCIENCE DEGREE REQUIREMENTS**

**Mathematics**

Two (2) 3+ credits of intermediate/advanced level MATH, COMP SCI, STAT

Limit one each: COMP SCI, STAT

**Foreign Language**

Complete the third unit of a foreign language

Note: A unit is one year of high school work or one semester/term of college work.

**L&S Breadth**

• Humanities, 12 credits: 6 of the 12 credits must be in literature

• Social Sciences, 12 credits

• Natural Sciences, 12 credits: must include 6 credits in biological science; and must include 6 credits in physical science

**Liberal Arts and Science Coursework**

108 credits

**Depth of Intermediate/Advanced work**

60 intermediate or advanced credits

**Major**

Declare and complete at least one (1) major

**Total Credits**

120 credits

**UW-Madison Experience**

30 credits in residence, overall

30 credits in residence after the 90th credit

**Minimum**

2,000 in all coursework at UW–Madison

2,000 in intermediate/advanced 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 and do not need to complete the L&S breadth and
degree requirements above. Please note that the following special degree programs are not considered majors so are not available to non-L&S-degree-seeking candidates:

- Applied Mathematics, Engineering and Physics (Bachelor of Science—Applied Mathematics, Engineering and Physics)
- Journalism (Bachelor of Arts—Journalism; Bachelor of Science—Journalism)
- Music (Bachelor of Music)
- Social Work (Bachelor of Social Work)

### REQUIREMENTS FOR THE MAJOR

**MATH, CHEMISTRY, AND PHYSICS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 301</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences</td>
<td>3</td>
</tr>
</tbody>
</table>

**General Chemistry**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 103</td>
<td>General Chemistry I</td>
<td>5-9</td>
</tr>
<tr>
<td>&amp; CHEM 104</td>
<td>and General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>or CHEM 109</td>
<td>Advanced General Chemistry</td>
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**Organic Chemistry**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 341</td>
<td>Elementary Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 343</td>
<td>Introductory Organic Chemistry</td>
<td></td>
</tr>
</tbody>
</table>

**Physics**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYSICS 115</td>
<td>Energy (preferred)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 103</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 104</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 201</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 202</td>
<td>General Physics</td>
<td></td>
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<tr>
<td>PHYSICS 207</td>
<td>General Physics</td>
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<tr>
<td>PHYSICS 208</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 247</td>
<td>A Modern Introduction to Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 248</td>
<td>A Modern Introduction to Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 249</td>
<td>A Modern Introduction to Physics</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 14-20

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1. STAT 371, MATH 211 or MATH 221 are strongly recommended for students preparing for Graduate School, as these are usually 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). Please note PHYSICS 107 and PHYSICS 109 do not fulfill this requirement.

### BIOLOGY AND BOTANY REQUIREMENTS

30 credits from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOTANY/</td>
<td>General Botany</td>
<td>1</td>
</tr>
<tr>
<td>BIOLOGY</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>BOTANY/</td>
<td>Introductory Biology</td>
<td></td>
</tr>
<tr>
<td>BIOLOGY/</td>
<td>ZOOLOGY 151</td>
<td></td>
</tr>
<tr>
<td>BOTANY/</td>
<td>Introductory Biology</td>
<td></td>
</tr>
<tr>
<td>BIOLOGY/</td>
<td>ZOOLOGY 152</td>
<td></td>
</tr>
<tr>
<td>BIOCORE</td>
<td>Evolution, Ecology, and Genetics</td>
<td></td>
</tr>
<tr>
<td>BIOCORE</td>
<td>Evolution, Ecology, and Genetics Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOCORE</td>
<td>Cellular Biology</td>
<td></td>
</tr>
<tr>
<td>BIOCORE</td>
<td>Cellular Biology Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOCORE</td>
<td>Organismal Biology</td>
<td></td>
</tr>
</tbody>
</table>

**Code**

**Title**

One Intermediate/Advanced course in all four of the following areas:

1. Cell, Molecular, Physiology:
   - BOTANY 300 Plant Anatomy
   - or BOTANY 500 Plant Physiology

2. Ecology:
   - BOTANY/ F&W ECOL 455 The Vegetation of Wisconsin
   - or BOTANY/ F&W ECOL/ ZOOLOGY 460 General Ecology

3. Genetics, Evolution:
   - BOTANY/ ANTHRO/ ZOOLOGY 410 Evolutionary Biology
   - AGRONOMY/ HORT 338 Plant Breeding and Biotechnology
   - GENETICS 466 Principles of Genetics
   - GENETICS 467 General Genetics 1
   - GENETICS 468 General Genetics 2

4. Diversity:
   - BOTANY 305 Plant Morphology and Evolution
   - BOTANY 330 Algae
   - BOTANY/ PL PATH 332 Fungi
   - BOTANY 400 Plant Systematics
   - BOTANY 401 Vascular Flora of Wisconsin

One Intermediate/Advanced course in the following electives OR any other, additional course, from the above four areas:

- BOTANY/ GEOG 338 Environmental Biogeography
Code | Title | Credits
--- | --- | ---
BOTANY 403 | Field Collections and Identification | 3
BOTANY 422 | Plant Geography | 3
BOTANY 450 | Midwestern Ecological Issues: A Case Study Approach | 3
BOTANY/ENTOM/ ZOOLOGY 473 | Plant-Insect Interactions | 3
BOTANY 563 | Phylogenetic Analysis of Molecular Data | 3
BOTANY 621 | Plant Biochemistry | 3
BOTANY/ENVIR ST/ F&W ECOL/ ZOOLOGY 651 | Conservation Biology | 3
BIOCHEM 501 | Introduction to Biochemistry | 3
BIOCORE 486 | Organismal Biology Laboratory | 3
BIOCORE 587 | Biological Interactions | 3
F&W ECOL 415 | Tree Physiology | 3
MICROBIO 303 | Biology of Microorganisms | 3
ZOOLOGY 570 | Cell Biology | 3

**Independent Research Experience—choose one:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOTANY 691 &amp; BOTANY 692</td>
<td>Senior Thesis and Senior Thesis</td>
<td>4</td>
</tr>
<tr>
<td>BOTANY 681 &amp; BOTANY 682</td>
<td>Senior Honors Thesis and Senior Honors Thesis</td>
<td>6</td>
</tr>
<tr>
<td>BOTANY 699</td>
<td>Directed Study</td>
<td>3-4</td>
</tr>
</tbody>
</table>

**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:

- Earn a 3.300 overall university GPA
- Earn a 3.400 GPA in all courses accepted in the major
- A Senior Honors Thesis in BOTANY 681 and BOTANY 682, for a total of 6 credits, and
- 12 credits in intermediate/advanced BOTANY, taken for Honors

**UNIVERSITY DEGREE REQUIREMENTS**

- 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.
- 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.
- 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. 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.

**ADVISING AND CAREERS**

**ADVISING**

The Department of Botany encourages our majors to begin working on their career exploration and preparation soon after arriving on campus. We partner with SuccessWorks in the College of Letters & Science. L&S 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.

**L&S CAREER RESOURCES**

SuccessWorks at the College of Letters & Science helps students leverage the academic skills learned in their major, certificates, 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).

SuccessWorks can also assist students in career advising, résumé and cover letter writing, networking opportunities, and interview skills, as well as course offerings for undergraduates to begin their career exploration early in their undergraduate career.

- SuccessWorks (https://careers.ls.wisc.edu)
- Set up a career advising appointment (https://careers.ls.wisc.edu/make-an-appointment)
- INTER-LS 210 L&S Career Development: Taking Initiative (1 credit, targeted to first- and second-year students)—for more information, see Inter-LS 210: Career Development, Taking Initiative (https://careers.ls.wisc.edu/inter-ls-210-career-development-taking-initiative)
- Learn how we're transforming career preparation: L&S Career Initiative (http://ls.wisc.edu/lsci)

**PEOPLE**

Professors Ane, Baum, Cameron (chair), Emshwiller, Fernandez, Gilroy, Givnish, Graham, Hotchkiss, Larget, Otegui, Spalding, Sytsma, Waller

Associate Professor Pringle

Assistant Professors Keefover-Ring, Maeda, McCulloh

Majors will eventually choose from the faculty a Senior Thesis advisor, who then will be the student’s undergraduate advisor. Prospective majors should contact the general advisors directly.