

BOTANY, PHD

Graduate students in Botany work with faculty and staff on a range of projects in plant biology at all levels of organization – from molecules, through cells and organs, to populations, communities, and lineages of organisms. Major research areas include evolution and systematics; molecular, cellular, and developmental biology; plant biology; biochemistry; and ecology. We also provide advanced instruction and opportunities for research in phycology, bryology, mycology, ethnobotany, paleoecology, conservation and restoration ecology, taxonomy, genetics, and physiology. Increasingly, graduate student projects encompass two or more of these categories.

Students interested in fields bordering botany will find rich opportunities for coursework, collaborative research, and seminars in many other departments and schools such as Bacteriology, Biochemistry, Chemistry, Engineering, Entomology, Forest and Wildlife Ecology, Genetics, Geography, Geoscience, Integrative Biology, Physics, Plant and Agroecosystem Sciences, Plant Breeding/ Plant Genetics, Plant Pathology, Statistics, Soil Science, and the Nelson Institute for Environmental Studies. Interdisciplinary work is encouraged.

Graduate study in the Department of Botany requires a combination of advanced coursework, participation in seminars, and original research. Course requirements follow one of four pathways: general botany; ecology; evolution; or molecular, cellular, and developmental biology. The department encourages students to pursue independent research soon after arriving. In consultation with the faculty advisor, each student selects a pathway that includes courses and research topics related to their interests as well as training in the array of techniques and approaches needed to pursue research.

ADMISSIONS

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Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. **Applicants must meet the minimum requirements (<https://grad.wisc.edu/apply/requirements/>) of the Graduate School as well as the program(s).** Once you have researched the graduate program(s) you are interested in, apply online (<https://grad.wisc.edu/apply/>).

Requirements	Detail
Fall Deadline	December 1
Spring Deadline	The program does not admit in the spring.
Summer Deadline	The program does not admit in the summer.
GRE (Graduate Record Examinations)	Not required.

English Proficiency Test

Every applicant whose native language is not English, or whose undergraduate instruction was not exclusively in English, must provide an English proficiency test score earned within two years of the anticipated term of enrollment. Refer to the Graduate School: Minimum Requirements for Admission policy: <https://policy.wisc.edu/library/> UW-1241 (<https://policy.wisc.edu/library/UW-1241/>).

Other Test(s) (e.g., GMAT, MCAT)

The GRE subject test in Biology or in Cell and Molecular Biology is not required.

Letters of

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Recommendation Required

Please submit all your application materials before the fall deadline to ensure full review of your application. Applications submitted after the above deadline through April 15 will be considered if space is still available. Space for students is typically limited by the department's ability to provide financial support (<https://botany.wisc.edu/financial-support/>). To check if space is available, please email: gradinfo@botany.wisc.edu or contact faculty (<https://botany.wisc.edu/botany-faculty/>) with whom you are interested in working to ask if they have graduate student funding available.

The Department of Botany will consider applicants for graduate degrees who surpass the minimum admissions requirements of the Graduate School. Neither the general Graduate Record Exam (GRE) nor the Graduate Record Exam subject test in Biology or in Cell and Molecular Biology is required. Admission is based on the applicant's statement of purpose, undergraduate record, letters of recommendation, experience in research, and the interests they share with one or more potential faculty advisors.

Courses may be required to address deficiencies in the following: GENETICS 466 Principles of Genetics or equivalent; CHEM 103 General Chemistry I and CHEM 104 General Chemistry II or equivalent; CHEM 341 Elementary Organic Chemistry or equivalent; a physics course including electricity and light; one semester of statistics; one semester of calculus. Contact the department for more information.

FUNDING

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (<https://grad.wisc.edu/funding/>) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

PROGRAM RESOURCES

Financial support is available to qualified graduate students in the form of teaching, research, and project **assistantships** and **fellowships**. Typically, there are approximately 35 graduate students who hold assistantships or fellowships in the botany department. In addition, graduate students are eligible for a number of **intradepartmental awards and grants**.

Graduate students who have a teaching, research, or project assistantship of at least a 33.3% appointment (approximately 13.3 hours per week)

for a fall or spring term are eligible to receive **remission of full tuition**. Fellowships or traineeships that are payrolled through the university and that carry stipends equivalent to at least a 33.3% research assistantship also qualify for remission of nonresident tuition. Tuition remission is conditionally awarded at the start of the semester based on the expectation that actual earnings during the semester will be at least 33.3% of the full-time rate. All students pay segregated fees. The only exception is that fellowships paid through the Graduate School have segregated fees waived in addition to tuition.

Assistantships and fellowships also provide **eligibility for an excellent health insurance program**, an extremely valuable benefit that provides single or family coverage that is more comprehensive than individuals can usually purchase on their own.

TEACHING ASSISTANTSHIPS

The most common source of support is a teaching assistantship. Historically, stipend rates for teaching and project assistants are governed by the Teaching Assistants' Association (TAA) bargaining unit.

To receive a teaching assistantship, candidates for admission must meet the following requirements:

- evidence (usually from the undergraduate transcript) of an appropriate background in the relevant subject matter of the course(s) to which appointment is being considered;
- evidence (usually from letters of recommendation or verbal communication) of the candidate's potential as a teaching assistant;
- an undergraduate GPA of 3.0 or above (on a 4.0 scale); and
- for students whose native language is not English, evidence of competence in spoken English through the SPEAK test that is administered by the UW. International applicants should note that a TA appointment is not normally possible during the first year of graduate study.

Current students who apply for their first teaching assistantship are also subject to the above criteria, as well as their performance as a graduate student. Reappointment as a teaching assistant depends upon satisfactory progress as a graduate student, satisfactory performance as a teaching assistant, and completing the Equity/Diversity TA Training.

Teaching assistants may be eligible for University teaching awards (<https://grad.wisc.edu/taawards/>), including the UW–Madison Early Excellence in Teaching Award, UW–Madison Exceptional Service Award, UW–Madison Innovation in Teaching Award, UW–Madison Capstone PhD Teaching Award, and the College of Letters & Science Teaching Fellow.

RESEARCH OR PROJECT ASSISTANTSHIPS

Research and project assistantships are made possible by grants awarded to individual professors for particular research programs. Recipients are selected by the individual professor concerned. Availability of research and project assistantships varies.

ADVANCED OPPORTUNITY FELLOWSHIPS

Advanced Opportunity Fellowships (AOF) are granted to the UW–Madison's Graduate School by the State of Wisconsin and are combined with other graduate education funds to support the recruitment and retention of highly qualified underrepresented students in UW–Madison graduate programs. Fellowships are competitive and merit-based. AOF funding is intended to increase the racial and ethnic diversity of the graduate student population, as well as to support economically disadvantaged and first-generation college students. AOF fellowships are

paid through the Graduate School by the College of Letters & Science's **Community of Graduate Research Scholars** (<http://ls.wisc.edu/current-students/graduate-students/cgrs/>) (C-GRS) program.

EXTERNAL FELLOWSHIPS

Fellowships from professional societies and outside agencies provide another important source of aid for which students may apply either before or after commencing graduate work at UW–Madison. If necessary, external fellowships can often be supplemented with university funds up to prevailing university fellowship rates.

All qualified students who are U.S. citizens, nationals, or permanent resident aliens of the U.S. are urged to apply to the National Science Foundation for the pre-doctoral fellowship competition. Students apply directly to NSF; the closing date is usually in early November. Please check the NSF website (<http://www.nsf.gov/>) for the application instructions and deadline.

INTRADEPARTMENTAL FELLOWSHIPS AND AWARDS

For more information on Intradepartmental Fellowships and Awards, please see the latest descriptions (<https://botany.wisc.edu/financial-support/>) on the botany website.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/#policiesandrequirements>), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW–Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirement Detail

Minimum Credit Requirement	51 credits
Minimum Residence Credit Requirement	32 credits
Minimum Graduate Coursework Requirement	26 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/).
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/).
Other Grade Requirements	Students must earn a B or above in all track coursework and maintain a 3.00 GPA in all minor coursework.
Assessments and Examinations	The preliminary examination should be taken by the end of the fourth semester in residence and must be taken by the end of the fifth semester. The preliminary exam includes a written research proposal, an oral presentation of the proposal to committee members, and an oral exam. At least one semester of at least a 33% Teaching Assistantship appointment is required. During the final semester, candidates must present a department seminar on their dissertation research and complete a final oral exam. A written dissertation based on work conducted in a formal research course is required. All PhD dissertations must be deposited at the Graduate School.
Language Requirements	Language requirements are determined on an individual basis with the major professor and will depend on the area concentration within the department.
Graduate School Breadth Requirement	All doctoral students are required to complete a doctoral minor or graduate/professional certificate. Refer to the Graduate School: Breadth Requirement in Doctoral Training policy: https://policy.wisc.edu/library/UW-1200 (https://policy.wisc.edu/library/UW-1200/). For an "Option A" minor, the department signs the minor agreement. For an "Option B" minor between two or more departments, the Botany chair signs the minor agreement.

REQUIRED COURSES

A minimum of 51 credits in natural sciences (undergraduate and graduate program courses combined) is required. A minimum of 6 credits in graduate-level botany courses must be completed at UW–Madison. Seminars and research credits do not count toward the 6 credits in botany.

PhD students complete a minimum of 32 credits while in residence at the UW prior to earning dissertator status. For students completing a

Botany MS (<https://guide.wisc.edu/graduate/botany/botany-ms/>) at UW–Madison, credits taken toward that program can be used to satisfy these requirements. These credits complete the following requirements:

- Courses required for their selected pathway (see below)
- Six (6) credits within the botany department (can also fulfill track requirements)
- Two (2) seminar courses (at least one in BOTANY; see full list of seminars below)
- Courses for the student's minor field of study
- Courses assigned by the Academic Advisory Committee and/or the student's PhD committee
- Research credits (see full list of research courses below)

Each graduate student in botany selects one of the following pathways¹:

General Botany Pathway¹

Complete one course from each of the following.

- genetics,
- biochemistry, cell or molecular biology,
- plant physiology or plant developmental biology,
- cryptogamic botany,
- plant anatomy or morphology,
- ecology, and
- evolution or systematics

¹ These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

Ecology Pathway¹

Complete a minimum of five courses as follows:

- at least three courses (minimum of 9 credits) in ecology,
- one course in evolution, and
- one course in any of the following: systematics; cryptogamic botany; biochemistry, cell or molecular biology; plant physiology or plant developmental biology; plant anatomy or morphology; or genetics

¹ These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

Evolution Pathway¹

Complete a minimum of five courses, at least one from each of the following:

- evolution,
- systematics or cryptogamic botany,
- population or quantitative genetics,
- ecology, and
- one course in any of the following: biochemistry, cell or molecular biology; plant physiology or plant developmental biology; or plant anatomy or morphology

¹ These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

Molecular, Cellular, and Developmental Biology (MCDB) Pathway¹

Complete a minimum of five courses, at least one from each of the following:

- plant anatomy or morphology,
- biochemistry, cell or molecular biology,
- plant physiology,
- plant developmental biology or genetics, and
- one course in any of the following: ecology; systematics; evolution; or cryptogamic botany

¹ These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

Seminar Course Options

Code	Title	Credits
BOTANY/ATM OCN/ CIV ENGR/ ENVIR ST/GEOSCI/ ZOOLOGY 911	Limnology and Marine Science Seminar	1
BOTANY 920	Seminar in Algology: Fresh Water Algae	1
BOTANY/ PL PATH 930	Seminar-Mycology	1
BOTANY 940	Seminar in Plant Systematics and Evolution	1
BOTANY 950	Seminar-Plant Ecology	1
BOTANY 960	Seminar-Plant Physiology	1
BOTANY/ATM OCN/ ENVIR ST/ F&W ECOL/ GEOG/GEOSCI/ ZOOLOGY 980	Earth System Science Seminar	1
ENTOM 601	Seminar in Methods of Scientific Oral Presentations	1
ENTOM 901	Seminar in Organismal Entomology	1
GENETICS 670	Seminar in Clinical Cytogenetics	1
GENETICS 672	Seminar in Laboratory Operations and Quality Control	1
GENETICS 673	Seminar in Clinical Cytology	1
GENETICS/AN SCI/ DY SCI 951	Seminar in Animal Breeding	0-1
GENETICS/ AGRONOMY/ HORT 957	Seminar-Plant Breeding	1
GENETICS 993	Seminar in Genetics	0-1
GEOG 900	Seminar in Geography	1-3
GEOG 901	Seminar in Cultural Geography	2-3

GEOG 918	Seminar in Political Geography	2-3
GEOG 920	Seminar in Physical Geography	1-3
GEOG 930	Seminar in People-Environment Geography	2-3
GEOG/ HISTORY 932	Seminar in American Environmental History	3
GEOG 970	Seminar in Geographic Information Science	1-3
GEOG/ATM OCN/ BOTANY/ENVIR ST/ F&W ECOL/ GEOSCI/ ZOOLOGY 980	Earth System Science Seminar	1
GEOG/A A E/ ANTHRO/C&E SOC/ HISTORY/LACIS/ POLI SCI/PORTUG/ SOC/SPANISH 982	Interdepartmental Seminar in the Latin-American Area	1-3
GEOG/AFRICAN/ ANTHRO/ ECON/HISTORY/ POLI SCI 983	Interdepartmental Seminar in African Studies Topics	3
HORT 910	Seminar	1
HORT/AGRONOMY/ GENETICS 957	Seminar-Plant Breeding	1
SOIL SCI 728	Graduate Seminar	1
ZOOLOGY/ ATM OCN/BOTANY/ CIV ENGR/ ENVIR ST/ GEOSCI 911	Limnology and Marine Science Seminar	1
ZOOLOGY/AN SCI/ OBS&GYN 954	Seminar in Endocrinology-Reproductive Physiology	0-1
ZOOLOGY 955	Seminar-Limnology	1
ZOOLOGY 956	Seminar-Ecology	1
ZOOLOGY 957	Seminar-Evolution	1
ZOOLOGY 958	Seminar-Biophysical and Physiological Ecology	1
ZOOLOGY 960	Seminar in Cellular Biology	1
ZOOLOGY/ ATM OCN/ BOTANY/ENVIR ST/ F&W ECOL/GEOG/ GEOSCI 980	Earth System Science Seminar	1
ENVIR ST/ PUB AFFR/ URB R PL 810	Energy Analysis and Policy Capstone	3
ENVIR ST 900	Seminar	1-3
ENVIR ST/ URB R PL 923	Seminar-Land Problems: Institutional Development	2-3
ENVIR ST/ ATM OCN 925	Seminar-Climatology	1-2
ENVIR ST 950	Environmental Monitoring Seminar	2

F&W ECOL/ AGRONOMY/ ATM OCN/ BOTANY/ENTOM/ ENVIR ST/GEOG/ ZOOLOGY 953	Introduction to Ecology Research at UW-Madison	1-2
F&W ECOL 961	Wildlife Seminar	1
GEOSCI 920	Seminar in Glacial and Pleistocene Geology	1-3
GEOSCI 929	Seminar-Hydrogeology	1-2
GEOSCI 940	Seminar in Paleontology	1
GEOSCI 970	Seminar-Geochemistry	2
GEOSCI 991	Seminar: Geophysics	1-3
AGRONOMY 920	Seminar	1
AGRONOMY/ GENETICS/ HORT 957	Seminar-Plant Breeding	1
ATM OCN 900	Seminar-Meteorology	1-2
ATM OCN/ ENVIR ST 925	Seminar-Climatology	1-2
ATM OCN 965	Seminar-Oceanography	1-2
M S & E 900	Materials Research Seminar	1
M&ENVTOX 800	Seminar	1

Research Course Options

Code	Title	Credits
BOTANY 990	Research-Phycology	1-12
BOTANY 993	Research: Fungal Biology	1-12
BOTANY 994	Research-Plant Systematics	1-12
BOTANY 995	Research-Plant Ecology	1-12
BOTANY 996	Research-Plant Physiology	1-12
BOTANY 999	Independent Work	1-3

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (<https://grad.wisc.edu/acadpolicy/>) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Credits Earned at Other Institutions

No credits from other institutions are allowed to transfer toward the minimum credit requirement and the minimum graduate coursework requirement.

Undergraduate Credits Earned at Other Institutions or UW-Madison

No credits from an undergraduate degree are allowed to transfer toward the minimum graduate degree credit requirement and the minimum graduate coursework requirement.

Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)

No credits from a UW-Madison professional degree are allowed to transfer toward the minimum credit requirement and the minimum graduate coursework requirement.

Credits Earned as a University Special Student at UW-Madison

No credits earned as a UW-Madison Special student are allowed to transfer toward the minimum residence credit requirement, the minimum credit requirement, or the minimum graduate coursework requirement.

PROBATION

Refer to the Graduate School: Probation (<https://policy.wisc.edu/library/UW-1217/>) policy.

ADVISOR / COMMITTEE

A major professor must be chosen as soon as possible after beginning graduate study and in all cases by the end of the first year. A vice major professor is required.

Students meet with an advisory committee before their first semester and with their thesis committee by the end of their first year to plan their coursework.

Students are required to conduct a yearly progress report meeting with their thesis committee after passing the preliminary examination.

CREDITS PER TERM ALLOWED

15 credits

TIME LIMITS

The doctoral degree is typically completed within five to six years. Refer to the Graduate School: Time Limits (<https://policy.wisc.edu/library/UW-1221/>) policy.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employee disabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)

- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

Students should contact the department chair or program director with questions about grievances. They may also contact the L&S Academic Divisional Associate Deans, the L&S Associate Dean for Teaching and Learning Administration, or the L&S Director of Human Resources.

OTHER

Assistantships are only available for thesis MS and PhD degrees.

PROFESSIONAL DEVELOPMENT

PROFESSIONAL DEVELOPMENT GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (<https://grad.wisc.edu/pd/>) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES

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1. Demonstrate a fundamental breadth of understanding of the basic properties of plant life from the subcellular to the ecosystem level of organization, and an ability to integrate acquired botanical expertise with knowledge of related disciplines including, but not limited to, mathematics, physical sciences, and other life sciences.
2. Apply all elements of the methodological or theoretical framework within a specialized botanical subdiscipline to skillfully develop and execute original research, thereby demonstrating intellectual and technical competency appropriate to that subdiscipline.
3. Achieve a professional level of proficiency communicating scientific research proposals and/or results in written format.
4. Develop skills in oral presentation of scientific research data to peers and general audiences.
5. Evaluate, critique, and apply critical thinking skills to the generation of hypotheses, analysis of data, and interpretation of scientific results in botany and related disciplines.
6. Value and promote professional ethics in the collection, analysis, storage, and presentation of scientific data.
7. Engage in critical and respectful debate, discussion, and exchange of scientific information among peers and audiences of diverse intellectual and personal backgrounds.
8. Appreciate the importance of professional service.

PEOPLE

PEOPLE

Faculty: See Botany (<https://botany.wisc.edu/botany-faculty/>)