BOTANY, M.S.

The Department of Botany consists of 18 faculty members with about 45 graduate students pursuing M.S. and Ph.D. degrees. The American Council on Education Rating of Graduate Program Quality ranks the department among the top five departments of botany in the country.

Graduate students 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 molecular, cellular, and developmental biology; structural plant biology; ecology; evolution; and systematics. 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. Master’s students may complete a non-thesis program in conservation or restoration ecology designed to prepare them for careers in environmental consulting, natural resource agencies, and nongovernmental organizations.

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

Graduate study in the Department of Botany requires a combination of advanced course work, participation in seminars, and original research. Course requirements follow one of five tracks: general botany; ecology; evolution; molecular, cellular, and developmental biology; or the non-thesis master’s degree in conservation and restoration ecology. The department encourages students to pursue independent research soon after arriving. In consultation with the faculty advisor, each student selects a track that includes courses and research topics related to his or her interests and training in the array of techniques and approaches needed to pursue research.

ADMISSIONS

GRADUATE SCHOOL ADMISSIONS

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

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
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</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>December 1</td>
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<tr>
<td>Spring Deadline</td>
<td>The program does not admit in the spring.</td>
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<tr>
<td>Summer Deadline</td>
<td>The program does not admit in the summer.</td>
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<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Not required but may be considered if available.</td>
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English Proficiency Test

Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (https://grad.wisc.edu/apply/requirements/english-proficiency).

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

The GRE subject test in Biology or in Cell and Molecular Biology is not required but, if available, will be considered.

Letters of Recommendation

Required

The Department of Botany will consider applicants for graduate degrees who surpass the minimum admissions requirements of the Graduate School. Candidates for fall admission should submit their full applications to the department by December 1 to be considered for financial support. Applications may be reviewed until April 15. The general Graduate Record Exam (GRE) is not required, but if available, will be considered in the admissions process. The GRE subject test in Biology or in Cell and Molecular Biology is not required but, if available, will be considered. 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.

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 processes 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 assistantships 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 Ph.D. 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 US citizens, nationals or permanent resident aliens of the US 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/#policiesandrequirementstext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
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<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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Mode of Instruction Definitions

- **Evening/Weekend**: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.
- **Online**: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.
- **Hybrid**: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.
- **Accelerated**: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

CURRICULAR REQUIREMENTS

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<th>Requirement</th>
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<tr>
<td>Minimum</td>
<td>30 credits</td>
</tr>
<tr>
<td>Credit</td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td>16 credits</td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
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</tbody>
</table>
Minimum Graduate Coursework Requirement: Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (https://registrar.wisc.edu/course-guide/).

Overall Graduate GPA Requirement: 3.00 GPA required.

Other Grade Requirements: Students must earn a B or above in all track coursework.

Assessments and Examinations: A written thesis or research report based on work conducted in a formal research course and a final oral exam are required of all students who expect to continue for the Ph.D. degree. All master’s theses must be deposited at Memorial Library.

Students who wish to terminate their graduate studies at the master’s level may submit a literature review instead of a thesis.

Language Requirements: No language requirements.

COURSES REQUIRED
A minimum of 30 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. 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.

M.S. students complete a minimum of 16 credits while in residence at the UW, including:

- Courses required for their selected track (see below)
- Six (6) credits within the botany department (can also fulfill track requirements)
- Two (2) seminar courses
- Courses assigned by the Academic Advisory Committee and/or the student's M.S. committee
- Research credits

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

General Botany Track
M.S. students must have one course from at least six of the seven.

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

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

Ecology Track
M.S. students must have 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

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

Evolution Track
M.S. students must have 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

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

Molecular, Cellular, and Developmental Biology (MCDB) Track
M.S. students must have 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

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

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

GRADUATE PROGRAM HANDBOOK
The Graduate Program Handbook (https://uwmadison.app.box.com/v/botanyhandbook) is the repository for all of the program's policies and requirements.

PRIOR COURSEWORK

Graduate Work from Other Institutions
No credits from other institutions are allowed to count toward the minimum graduate degree credit requirement and the minimum graduate coursework requirement.

UW–Madison Undergraduate
No credits from a UW–Madison undergraduate degree are allowed to count toward the minimum graduate degree credit requirement and the minimum graduate coursework requirement.

UW–Madison University Special
No credits earned as a UW–Madison Special student are allowed to count toward the minimum graduate residence credit requirement, the minimum graduate degree credit requirement, or the minimum graduate coursework requirement.

PROBATION
The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

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 M.S. committee by the end of their first year to plan their coursework.

Students meet with their advisor on a regular basis to assess progress.

CREDITS PER TERM ALLOWED
15 credits

TIME CONSTRAINTS
The master's degree should be completed within two and one-half years of study.

OTHER
Assistantships are only available for thesis M.S. and Ph.D. degrees.

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
1. Acquire and demonstrate fundamental understanding of the basic properties of plant life from the subcellular to the ecosystem level of organization.
2. Use critical elements of the methodological or theoretical framework in a specialized botanical subdiscipline to develop hypotheses, acquire scientific information, and interpret results in the context of the historical scientific literature.
3. Develop the skills of communicating scientific information, especially in written form.
5. Recognize and apply ethical conduct in the collection, analysis, and presentation of scientific data.
6. Develop the skills essential to critical debate, discussion, and exchange of scientific information among peers and audiences of diverse intellectual and personal backgrounds.

PEOPLE
Faculty: Professors Ane, Baum, Cameron (chair), Emshwiller, Fernandez, Gilroy, Givnish, Graham, Hotchkiss, Larget, Otegui, Spalding, Sytsma, Waller; Associate Professors Maeda, Pringle; Assistant Professors Keeover-Ring, McCulloh; Affiliate and Adjunct Faculty: Amasino, Brunet, Damschen, Spooner, Wiedenhoft, P. Zedler