

# BOTANY, PH.D.

## 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. Details can be found in the Graduate School's Minimum Graduate Coursework (50%) policy ( <a href="https://policy.wisc.edu/library/UW-1244">https://policy.wisc.edu/library/UW-1244</a> ( <a href="https://policy.wisc.edu/library/UW-1244/">https://policy.wisc.edu/library/UW-1244/</a> )).
Overall Graduate GPA Requirement	3.00 GPA required. This program follows the Graduate School's policy: <a href="https://policy.wisc.edu/library/UW-1203">https://policy.wisc.edu/library/UW-1203</a> ( <a href="https://policy.wisc.edu/library/UW-1203/">https://policy.wisc.edu/library/UW-1203/</a> ).
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% TA 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 Ph.D. 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.

**Breadth Requirement** All doctoral students are required to complete a doctoral minor or Graduate/Professional certificate.

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. 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.

Ph.D. 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 Ph.D. committee
- Research credits (see full list of research courses below)

Each graduate student in botany selects one of the following pathways<sup>1</sup>:

#### General Botany Pathway<sup>1</sup>

Ph.D. students must have 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

<sup>1</sup>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 Pathway <sup>1</sup>

Ph.D. 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

<sup>1</sup>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 Pathway <sup>1</sup>

Ph.D. 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

<sup>1</sup>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) Pathway <sup>1</sup>

Ph.D. and 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

<sup>1</sup>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