

# BIOLOGY: PLANT BIOLOGY

**Admissions to the Biology: Plant Biology, B.A. named option have been suspended as of fall 2021 and will be discontinued as of fall 2024. If you have any questions, please contact the department.**

The **Plant Biology Named Option** allows biology majors to focus their studies on plant science and to have this reflected on their transcript. There are a number of departments at UW–Madison who host plant science–based majors, including agronomy, botany, horticulture, plant pathology, and forest and wildlife ecology. While those specialized majors offer in-depth programs in their disciplines, the Plant Biology Named Option allows students to pursue a course of study within the biology major and explore plant biology at the same time. Students in this option can fulfill their requirements with courses that emphasize various aspects of plant science, including anatomy, physiology, genetics, crop production, disease resistance, and molecular techniques in plant improvement. Students also participate in a one-credit seminar called Frontiers in Plant Science taught by two faculty from plant science departments.

Who should enroll in this option? Students with broad interest in biological sciences who also want to:

- Prepare for graduate work in a plant science field
- Prepare for advanced study or graduate work in a natural or environmental science field
- Concentrate their studies on the biology of plants

## REQUIREMENTS

### REQUIREMENTS FOR THE NAMED OPTION

Students must complete a minimum of 31 credits of Biological Science courses within the Introductory Biology, Foundation Course, Upper-Level Breadth in the Major, and Additional Lab or Field Research requirements. Unless specifically stated otherwise, courses may not be used to meet multiple requirements of the major.

#### CORE REQUIREMENTS

##### Mathematics and Statistics

Code	Title	Credits
Complete one of the following:		5-10
MATH 221	Calculus and Analytic Geometry 1	
MATH 171 & MATH 217	Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II	
Complete one of the following:		3-4
MATH 222	Calculus and Analytic Geometry 2	
STAT 301	Introduction to Statistical Methods	

STAT 371	Introductory Applied Statistics for the Life Sciences
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**Total Credits** 8-14

#### Chemistry

Code	Title	Credits
General Chemistry (Complete one of the following):		5-10
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
CHEM 109	Advanced General Chemistry	
CHEM 115 & CHEM 116	Chemical Principles I and Chemical Principles II	
Organic Chemistry		
CHEM 343	Organic Chemistry I	3
CHEM 344	Introductory Organic Chemistry Laboratory	2
CHEM 345	Organic Chemistry II	3

**Total Credits** 13-18

#### Physics

Code	Title	Credits
First Semester Physics (complete one of the following):		4-5
PHYSICS 103	General Physics	
PHYSICS 201	General Physics	
PHYSICS 207	General Physics	
Second Semester Physics (complete one of the following):		4-5
PHYSICS 104	General Physics	
PHYSICS 202	General Physics	
PHYSICS 208	General Physics	

**Total Credits** 8-10

#### Introductory Biology

Code	Title	Credits
Select one of the following options:		10-13
Option A:		
BIOLOGY/ BOTANY/ ZOOLOGY 151	Introductory Biology	
BIOLOGY/ BOTANY/ ZOOLOGY 152	Introductory Biology	
Option B:		
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	
Option C:		
ZOOLOGY/ BIOLOGY 101	Animal Biology	
ZOOLOGY/ BIOLOGY 102	Animal Biology Laboratory	
BOTANY/ BIOLOGY 130	General Botany	

**Foundation Course (complete one of the following):**

Students may use BIOCORE 381 and BIOCORE 383 toward **both** Introductory Biology **and** Foundation.

Code	Title	Credits
AGRONOMY/ HORT 338	Plant Breeding and Biotechnology	3
BIOCHEM 501	Introduction to Biochemistry	3
BIOCHEM 508	General Biochemistry II	3-4
BIOCORE 381 & BIOCORE 383	Evolution, Ecology, and Genetics and Cellular Biology	6
GENETICS 466	Principles of Genetics	3
GENETICS 468	General Genetics 2	3

**UPPER-LEVEL BREADTH IN THE MAJOR**

Minimum of 13 credits required and must include **one approved lab course**. Approved lab courses are indicated by footnote. A course taken to meet the Foundation requirement may not also count as Upper-Level Breadth in the Major.

- Complete at least two credits from either category A or B.
- Complete at least two credits from either category C or D.
- Complete at least two credits from category E.

**A. Cellular and Subcellular Biology**

Code	Title	Credits
AGRONOMY/ HORT 338	Plant Breeding and Biotechnology	3
AGRONOMY/ BOTANY/HORT 339	Plant Biotechnology: Principles and Techniques <sup>1</sup>	4
AGRONOMY/ BOTANY/HORT 340	Plant Cell Culture and Genetic Engineering	3
BIOCHEM 501	Introduction to Biochemistry	3
BIOCHEM 507	General Biochemistry I	3
BIOCHEM 508	General Biochemistry II	3-4
BIOCHEM/ BOTANY 621	Plant Biochemistry	3
BIOCHEM 570	Computational Modeling of Biological Systems	3
BOTANY/ENTOM/ PL PATH 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	3
GENETICS 466	Principles of Genetics	3
GENETICS 467	General Genetics 1	3

**B. Organismal Biology**

Code	Title	Credits
BIOCORE 486	Principles of Physiology Laboratory <sup>1</sup>	2
BOTANY 300	Plant Anatomy <sup>1</sup>	4
BOTANY 305	Plant Morphology and Evolution <sup>1</sup>	4
BOTANY 330	Algae <sup>1</sup>	3
BOTANY/ PL PATH 332	Fungi <sup>1</sup>	4
BOTANY/ PL PATH 333	Biology of the Fungi	2
BOTANY/ F&W ECOL 402	Dendrology <sup>1</sup>	2
BOTANY 500	Plant Physiology <sup>1</sup>	3-4

ENTOM/ ZOOLOGY 302	Introduction to Entomology <sup>1</sup>	4
PL PATH 558	Biology of Plant Pathogens <sup>1</sup>	3

**C. Ecology**

Code	Title	Credits
AGRONOMY/ BOTANY/ SOIL SCI 370	Grassland Ecology	3
BOTANY/ ZOOLOGY 450	Midwestern Ecological Issues: A Case Study Approach	2
BOTANY/ F&W ECOL 455	The Vegetation of Wisconsin <sup>1</sup>	4
BOTANY/ F&W ECOL/ ZOOLOGY 460	General Ecology <sup>1</sup>	4
BOTANY/ENTOM/ ZOOLOGY 473	Plant-Insect Interactions	3
BOTANY/ENVIR ST/ F&W ECOL/ ZOOLOGY 651	Conservation Biology	3
F&W ECOL 550	Forest Ecology	3
F&W ECOL/ LAND ARC/ ZOOLOGY 565	Principles of Landscape Ecology	2
GENETICS 528	Banking Animal Biodiversity: International Field Study in Costa Rica	1
MICROBIO/AN SCI/ BOTANY 335	The Microbiome of Plants, Animals, and Humans	3
PL PATH 300	Introduction to Plant Pathology <sup>1</sup>	4
PL PATH 315	Plant Microbiomes <sup>1</sup>	4
ZOOLOGY 304	Marine Biology	2
ZOOLOGY 320	Field Marine Biology <sup>1</sup>	3

**D. Evolution and Systematics**

Code	Title	Credits
ANTHRO/BOTANY/ ZOOLOGY 410	Evolutionary Biology	3
BIOLOGY/ GENETICS 522	Communicating Evolutionary Biology	2-3
BOTANY 400	Plant Systematics <sup>1</sup>	4
BOTANY 401	Vascular Flora of Wisconsin <sup>1</sup>	4
BOTANY 422	Plant Geography	3
BOTANY/ PL PATH 563	Phylogenetic Analysis of Molecular Data	3
GENETICS 468	General Genetics 2	3

**E. Applied Biology, Agriculture and Natural Resources**

Code	Title	Credits
A A E/AGRONOMY/ NUTR SCI 350	World Hunger and Malnutrition	3
AGRONOMY 300	Cropping Systems	3
AGRONOMY 302	Forage Management and Utilization	3
AGRONOMY/ HORT 360	Genetically Modified Crops: Science, Regulation & Controversy	2
AGRONOMY 377	Global Food Production and Health	3

AGRONOMY/ HORT 501	Principles of Plant Breeding	3
AGRONOMY/ ATM OCN/ SOIL SCI 532	Environmental Biophysics	3
AMER IND/ ANTHRO/ BOTANY 474	Ethnobotany	3-4
BIOCORE 587	Biological Interactions	3
BOTANY 403	Field Collections and Identification	1-4
DY SCI/ AGRONOMY 471	Food Production Systems and Sustainability	3
F&W ECOL/ HORT/LAND ARC/ PL PATH 309	Diseases of Trees and Shrubs	3
F&W ECOL 410	Principles of Silviculture	3
F&W ECOL 415	Tree Physiology	3
GENETICS 548	The Genomic Revolution	3
GENETICS/ HORT 550	Molecular Approaches for Potential Crop Improvement	3
HORT/ LAND ARC 263	Landscape Plants I <sup>1</sup>	3
HORT 370	World Vegetable Crops	3
HORT 372	Seminar in Organic Agriculture	1
HORT/ AGRONOMY 376	Tropical Horticultural Systems	2
HORT 378	Tropical Horticultural Systems International Field Study	2
MED PHYS/NTP 651	Methods for Neuroimaging Research	3
PL PATH/ SOIL SCI 323	Soil Biology	3
PL PATH 517	Plant Disease Resistance	2-3
ZOOLOGY 500	Undergraduate Neurobiology Seminar	1

## ADDITIONAL LAB OR FIELD RESEARCH

In addition to the Lab requirement, complete one of the following requirements:

- Complete one *additional* lab course and at least two credits from categories A-E in the Upper-Level Breadth in the Major course lists, or
- Complete at least two credits of directed study in a biological science discipline, or
- Complete a two-semester thesis in biological science.

### Approved Directed Study Courses

To have Directed Study count for the Additional Lab/Field Research requirement, students must first complete an Introductory Biology sequence.

Code	Title	Credits
AGRONOMY 699	Special Problems	
ANATOMY 699	Independent Study	
ANESTHES 699	Independent Study	
AN SCI 699	Special Problems	

BIOCHEM 699	Special Problems	
BIOLOGY 699	Directed Studies	
BOTANY 699	Directed Study	
BMOLCHEM 699	Special Research Problems	
COMP BIO 699	Directed Study	
CRB 699	Independent Study	
DY SCI 699	Special Problems	
ENTOM 699	Special Problems	
FAM MED 699	Directed Study	
FOOD SCI 699	Special Problems	
F&W ECOL 699	Special Problems	
GENETICS 699	Special Problems	
HORT 699	Special Problems	
M&ENVTOX 699	Special Problems	
MEDICINE 699	Independent Study	
MED SC-V 699	Directed Study	
MICROBIO 699	Special Problems	
M M & I 699	Directed Study	
MOL BIOL 699	Directed Studies in Molecular Biology	
NEURODPT 699	Directed Study	
NEUROL 699	Directed Research in Neurology	
NEURSURG 699	Neurosurgery: Directed in Study in Research	
NURSING 699	Directed Study in Nursing	
NUTR SCI 699	Special Problems	
OBS&GYN 699	Directed Study	
ONCOLOGY 699	Special Research Problems	
OPHTHALM 699	Directed Study	
PATH 699	Independent Study	
PATH-BIO 699	Directed Study	
PEDIAT 699	Independent Study	
PHM SCI 699	Advanced Independent Study	
PHMCOL-M 699	Independent Study	
PHYSIOL 699	Independent Work	
PL PATH 699	Special Problems	
RHAB MED 699	Independent Study	
SOIL SCI 699	Special Problems	
SURG SCI 699	Directed Study	
SURGERY 699	Independent Study	

### Approved Thesis Sequences

Code	Title	Credits
AGRONOMY 681 & AGRONOMY 682	Senior Honors Thesis and Senior Honors Thesis	
AN SCI 681 & AN SCI 682	Senior Honor Thesis and Senior Honors Thesis	
AN SCI 691 & AN SCI 692	Thesis and Thesis	
BIOCHEM 681 & BIOCHEM 682	Senior Honors Thesis and Senior Honors Thesis	
BIOCHEM 691 & BIOCHEM 692	Senior Thesis and Senior Thesis	

BIOLOGY 681 & BIOLOGY 682	Senior Honors Thesis and Senior Honors Thesis
BIOLOGY 691 & BIOLOGY 692	Senior Thesis and Senior Thesis
BOTANY 681 & BOTANY 682	Senior Honors Thesis and Senior Honors Thesis
BOTANY 691 & BOTANY 692	Senior Thesis and Senior Thesis
DY SCI 681 & DY SCI 682	Senior Honors Thesis and Senior Honors Thesis
ENTOM 681 & ENTOM 682	Senior Honors Thesis and Senior Honors Thesis
FOOD SCI 681 & FOOD SCI 682	Senior Honors Thesis and Senior Honors Thesis
F&W ECOL 681 & F&W ECOL 682	Senior Honors Thesis and Senior Honors Thesis
F&W ECOL 691 & F&W ECOL 692	Senior Thesis and Senior Thesis
GENETICS 681 & GENETICS 682	Senior Honors Thesis and Senior Honors Thesis
H ONCOL 681 & H ONCOL 682	Senior Honors Thesis in Human Oncology 1 and Senior Honors Thesis in Human Oncology 2
H ONCOL 691 & H ONCOL 692	Senior Thesis in Human Oncology 1 and Senior Thesis in Human Oncology 2
HORT 681 & HORT 682	Senior Honors Thesis and Senior Honors Thesis
M M & I 691 & M M & I 692	First Semester Senior Thesis and Second Semester Senior Thesis
MICROBIO 681 & MICROBIO 682	Senior Honors Thesis and Senior Honors Thesis
MICROBIO 691 & MICROBIO 692	Senior Thesis and Senior Thesis
MOL BIOL 681 & MOL BIOL 682	Senior Honors Thesis and Senior Honors Thesis
MOL BIOL 691 & MOL BIOL 692	Senior Thesis and Senior Thesis
NUTR SCI 681 & NUTR SCI 682	Senior Honors Thesis and Senior Honors Thesis
NUTR SCI 691 & NUTR SCI 692	Senior Thesis-Nutrition and Senior Thesis
PL PATH 681 & PL PATH 682	Senior Honors Thesis and Senior Honors Thesis
SOIL SCI 681 & SOIL SCI 682	Senior Honors Thesis and Senior Honors Thesis
ZOOLOGY 681 & ZOOLOGY 682	Senior Honors Thesis and Senior Honors Thesis
ZOOLOGY 691 & ZOOLOGY 692	Senior Thesis and Senior Thesis

## UNDERGRADUATE PLANT SCIENCE SEMINAR

Code	Title	Credits
Complete one of the following:		
AGRONOMY 375	Special Topics (Biochemistry and Molecular Biology of Plants Seminar)	1-4
BIOCHEM 375	Special Topics (Biochemistry and Molecular Biology of Plants Seminar)	1-4
PL PATH 375	Special Topics (Frontiers in Plant Biology)	1-4

## RESIDENCE & QUALITY OF WORK

- 2.000 GPA in all BIOLOGY and major courses
- 2.000 GPA on at least 15 credits of Upper-Level work in the major, in Residence<sup>2</sup>
- 15 credits in the major, taken on the UW–Madison campus

## FOOTNOTES

1

Course also approved for lab credit

2

Foundation and Upper-Level Breadth in the Major courses are considered Upper-Level for purposes of this requirement.

## FOUR-YEAR PLAN

### SAMPLE FOUR-YEAR PLAN

This Sample Four-Year Plan is a tool to assist students and their advisor(s). Students should use it—along with their DARS report, the Degree Planner, and Course Search & Enroll tools—to make their own four-year plan based on their placement scores, credit for transferred courses and approved examinations, and individual interests. As students become involved in athletics, honors, research, student organizations, study abroad, volunteer experiences, and/or work, they might adjust the order of their courses to accommodate these experiences. Students will likely revise their own four-year plan several times during college.

Four-year Plans for the Biology major are designed to support biological science major exploration and planning your academic career. Your specific program of study could, and probably will, look different. You should customize the Four-Year Plan to fit your unique interests at UW–Madison. Consult with your advisor about the best plan for you.

### SAMPLE PLANT BIOLOGY OPTION FOUR-YEAR PLAN

#### Freshman

Fall	Credits	Spring	Credits
CHEM 103		4 CHEM 104	5
MATH 221 <sup>1</sup>		5 MATH 222 or STAT 371 <sup>1</sup>	4
Communication A		3 Literature Breadth	3
Social Science Breadth		3 Ethnic Studies/Social Science Breadth	3

15

15

**Sophomore**

<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
BIOLOGY/BOTANY/ ZOOLOGY 151 <sup>2</sup>	5	BIOLOGY/BOTANY/ ZOOLOGY 152 <sup>2</sup>	5
CHEM 343	3	CHEM 344	2
Literature Breadth	3	CHEM 345	3
Social Science Breadth	3	Humanities Breadth	3
INTER-LS 210	1	Elective	2
	<b>15</b>		<b>15</b>

**Junior**

<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
Foundation Course for Major	3	Upper-Level Breadth in the Major	3
PHYSICS 103	4	PHYSICS 104	4
Social Science Breadth	3	Plant Science Seminar	1
Electives	5	Humanities Breadth	3
Declare the Major		Electives	4
	<b>15</b>		<b>15</b>

**Senior**

<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
Upper-Level Breadth in the Major	3	Upper-Level Breadth in the Major	5
Upper-Level Breadth in the Major Lab or Field Research	3	Additional Lab or Field Research	2
Electives	9	Electives	8
	<b>15</b>		<b>15</b>

**Total Credits 120****1**

Follow the guidance of Math placement scores when choosing a Mathematics and/or Statistics course.

**2**

Students may complete one of three Introductory Biology requirements. See the Requirements tab for more information.