



# Plant Biology Major Requirements

Program in Biology Student Services

📍: 1140 Undergrad. Science Bldg. (USB)

🌐: <http://www.lsa.umich.edu/biology>

✉: [lsa-biology-advising@umich.edu](mailto:lsa-biology-advising@umich.edu)

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## Why study Biology?

Biology as a discipline is connected to many aspects of our everyday lives. From development and disease, to the food we eat, to the environment around us, studying biology brings us a deeper understanding of the world around us and allows us to benefit society through medicine, agriculture and environmental stewardship. Biology is a rapidly advancing area as we learn more every day about biological concepts ranging from our cells to our planet. Mastering biology opens up diverse careers in health science (medicine, dentistry, public health), biotechnology and pharmaceutical sciences, biological research, environmental policy, conservation and wildlife biology, ecological monitoring, and farming.

## Who should major in Plant Biology?

The Plant Biology major provides undergraduates with training in those areas of science that are essential to an understanding of modern plant sciences. Like the Biology major, Plant Biology deals with all of the major levels of biological organization (molecular, cellular, organismal, ecological, and evolutionary), but differs from the Biology major by its greater emphasis on the biology of plants. This program is well-suited for those who wish to study biology as part of a liberal education or to prepare for a teaching career in secondary schools. It also provides excellent preparation for graduate study in basic and applied areas of the plant sciences and related fields, such as ecology, genetics, microbiology, and biochemistry. Students intending to go to medical school should compare degree requirements to the med school requirements found here: <http://www.lsa.umich.edu/advising/academicplanning/prehealth>. It is strongly recommended that pre-med and other pre-health students meet with an LSA pre-health advisor.

**Exclusions:** Students who elect a major in Plant Biology may not elect the following majors: Biology; Biology, Health, and Society; General Biology; Cellular and Molecular Biology; CMB:BME; Ecology and Evolutionary Biology; Ecology, Evolution, and Biodiversity; Microbiology; or Neuroscience. They also may not elect an academic minor in Biology; Ecology and Evolutionary Biology; Plant Biology; Chemistry; or Biochemistry.

## How do I declare?

Students interested in any major in the biological sciences are encouraged to meet with an advisor to discuss their academic plans as soon as possible! Students need not have completed all of the major prerequisites to declare, but should have completed the biology introductory sequence with a 2.0 or better and be in good academic standing. Make an advising appointment online through the Biology website: [www.lsa.umich.edu/biology](http://www.lsa.umich.edu/biology).

## What courses should I take first?

The biological science introductory sequence consists of: BIOLOGY 171, BIOLOGY 172 or 174, and BIOLOGY 173.

Students should take 171 or 172/174 first and then follow with the second lecture course and 173. **(Note that the introductory biology sequence courses cannot be taken pass/fail.)**

- Students with an appropriate AP/IB score receive credit for BIOLOGY 195, which is the equivalent of BIOLOGY 171 & 172/174, but does NOT grant credit for 173.
- Transfer students who receive credit for BIOLOGY 191 should take BIOLOGY 192 and BIOLOGY 173 to complete the introductory biology sequence.

<p><b>BIOLOGY 171</b> ...focuses on ecology, biodiversity, and genetics and evolutionary processes. Students engage with biological hypotheses dealing with prominent current issues such as human evolutionary origins, emerging diseases, conservation biology, and global change.</p>	<p><b>BIOLOGY 172 or 174</b> <b>(prerequisite: prior or concurrent credit for CHEM 130)</b> ...focuses on how cells, organs, and organisms work. (174 covers the same material as 172 but is geared toward students who prefer a more problem-solving approach to understand biology, rather than a more traditional lecture-based course.)</p>
<p><b>BIOLOGY 173 (prerequisite = BIOLOGY 171, 172, 174, 191, or 195)</b> ...is the accompanying lab component to the introductory sequence. The course provides an integrated introduction to experimental biology. Topics focus on biochemistry, molecular genetics, evolution, and ecology.</p>	

### How do I get involved in research?

Independent research is a wonderful opportunity to take an active role in studying what you enjoy! Students participate in a lab, field, or modeling project in which they themselves have a say in the design, implementation, and interpretation of experiments. Please visit the Undergraduate Research web pages for the specific requirements for independent research and advice on how to choose a research area and mentor: <http://www.lsa.umich.edu/biology/studentresearch>.

### What are the requirements for Honors?

The Program in Biology administers an Honors Program to train students to conduct independent research in the biological sciences. Participating in the honors program allows students to develop their research skills, deepen their understanding of the field, and form productive relationships with faculty and other students. The achievement is noted on the diploma and official transcript.

In addition to completing all the requirements for the major, an honors degree requires:

- (1) an overall **and** major GPA of at least 3.4, and
- (2) the completion of a significant piece of independent research that is
  - (a) reported in an honors thesis and
  - (b) presented in a public forum.

For more information, including the Honors Program application, visit [lsa.umich.edu/biology/undergraduates/honors-program.html](http://lsa.umich.edu/biology/undergraduates/honors-program.html).

### How do I find out about internships, study abroad, or summer programs?

Information about study abroad, faculty-led intercultural internships, faculty-led courses and field experiences, and Spring/Summer language study is available through the Center for Global and Intercultural Study ([www.lsa.umich.edu/cgis](http://www.lsa.umich.edu/cgis)). The Opportunity Hub ([lsa.umich.edu/opportunityhub](http://lsa.umich.edu/opportunityhub)) also provides information on fellowships, internships and other student opportunities.

### Can I transfer courses from another institution?

The Program in Biology will review classes taken at other institutions to determine equivalency to University of Michigan Biology courses. (**Note that 300- and 400-level courses will not be evaluated for equivalent credit.**) If an external class is determined to be equivalent to a U-M course, it can be posted to your transcript as the U-M Biology course (with a "T") when you successfully complete the course *and* the transfer steps listed on the Biology website: [www.lsa.umich.edu/biology/transfercredit](http://www.lsa.umich.edu/biology/transfercredit). Approved equivalent courses may count toward major requirements, but transfer students are encouraged to meet with a major advisor to develop a major plan. **At least 20 of the 30 credits required for the Plant Biology major must be taken in-residence.**

[Note: You are welcome to request review of a course *before you take it*. You will need to provide a detailed syllabus, and must obtain one from the instructor in advance.]

### How can I get involved with student organizations?

There are several student organizations pertinent to biology-related majors. More detailed information is available on the Program in Biology website: [www.lsa.umich.edu/biology](http://www.lsa.umich.edu/biology).

- **Biology Student Alliance (BSA):** a student org. open to all Program in Biology & Neuro. majors as well as pre-med or other science-oriented students interested in biology research and outreach, and in collaborating and socializing with other biology-interested students. Email [bsa-eboard@umich.edu](mailto:bsa-eboard@umich.edu) for more information.
- **Botany Undergrads Doing Stuff (BUDS):** an extremely informal group of people dedicated to botany. Contact Faculty Advisors Robyn Burnham or Laura Olsen if interested.
- **Michigan Ecology and Evolutionary Biology Society (MEEBS):** The Michigan Ecology and Evolutionary Biology Society (MEEBS) is an informal club designed to create a community for EEB-interested students from any major. Contact faculty advisor [Catherine Badgley](#) or check out the MEEBS [Facebook page](#) for more information.
- **Neuroscience Students Association (NSA):** an organization for students with an interest in neuroscience. Email [nsaleadteam@umich.edu](mailto:nsaleadteam@umich.edu) for more information.

**ELECTIVE PLANT BIOLOGY COURSES:** Two courses from the Elective Plant Biology Course list are required; one must be a lab [indicated by an asterisk (\*) below].

EEB 372\* General Ecology Laboratory  
EEB 300\* Undergraduate Research (3 credit min./max.)  
EEB 400\* Advanced Research (3 credit min./max.)  
EEB 401 Advanced Topics (*applicable sections only*)  
EEB 412 Molecular Ecology  
EEB 420 Plant Evolution  
EEB 436\* Woody Plants  
EEB 455\* Ethnobotany (Sp at UMBS)  
EEB 457\* Algae in Freshwater Ecosystems (Su at UMBS in even years)  
EEB 459\* Systematic Botany  
EEB 463\* Neotropical Plants  
EEB 472 Plant-Animal Interactions  
EEB 556\* Field Botany of Northern Michigan (Su at UMBS)  
MCDB 300\* Undergraduate Research (3 credit min./max.)  
MCDB 400\* Advanced Research (3 credit min./max.)  
MCDB 401 Advanced Topics (*applicable sections only*)  
MCDB 413\* Plant Molecular Biology Lab  
MCDB 430 Plant Molecular Biology  
MCDB 433 Plant Biochemistry

- EEB/MCDB 300 or 400 (Independent Research), elected for a minimum of 3 credits in a single term and conducted in a plant biology research lab, may be used to fulfill the lab requirement. (3 credit max. applies; see *CONSTRAINTS*.)
- Any course used to fulfill this requirement cannot also be used as a Required Plant Biology Course; i.e., a course cannot “double-count.”

**ADDITIONAL ELECTIVE COURSES:**

- Choose additional Biology, EEB, or MCDB courses at the 200-level or above to reach 30 major credit hours.
  - BIOLOGY 200, BIOLOGY 241, EEB/MCDB 301, EEB/MCDB 302, EEB/MCDB 800, MCDB 412, and non-specific (departmental) transfer credit are EXCLUDED.
  - The fourth course not taken under “Required General Courses” may be used here.
  - One cognate course, with advisor approval, may be used toward the major.

# PLANT BIOLOGY MAJOR REQUIREMENTS

## PLANT BIOLOGY PREREQUISITES:

### Introductory Biology Sequence:

	TERM:	COURSE:	GRADE:
<input type="checkbox"/> Choose Sequence A, B, or C: A: BIO 171, BIO 172 or 174, & BIO 173 B: BIO 195 (AP/IB) & BIO 173 C. BIO 191 (transfer credit), BIO 192, & BIO 173			

### Chemistry Sequence:

<input type="checkbox"/> CHEM 210 & 211			
<input type="checkbox"/> CHEM 215 & 216			

### Quantitative Analysis Sequence:

<input type="checkbox"/> Quantitative Analysis 1: MATH 115, 120 (AP), 175, 185, or 295			
<input type="checkbox"/> Quantitative Analysis 2: One course from: MATH 116, 121 (AP), 156, 176, 186, or 296; STATS 180 (AP), 250, or 280; STATS 400-level or above (min. 3 credits); BIOLOGY 202; BIOPHYS/PHYSICS 290; EECS 183, 203, or 280; EARTH 468; or other course with a MATH 115 prereq. approved by a major advisor [Note: Any course used to fulfill this requirement cannot also be used as a major elective; i.e., a course cannot "double-count."]			

### Physics Sequence:

<input type="checkbox"/> PHYSICS I (lecture + lab): One of the following combinations: PHYSICS 125 & 127; 135 & 136; 140 & 141; or 160 & 161. [PHYSICS 139 (AP) will also fulfill this requirement.]			
<input type="checkbox"/> PHYSICS II (lecture + lab): One of the following combinations: PHYSICS 126 & 128; 235 & 236; 240 & 241; or 260 & 261. [PHYSICS 239 (AP) will also fulfill this requirement.]			

## PLANT BIOLOGY MAJOR:

### Required General Courses: Select at least three of the four courses listed.

<input type="checkbox"/> Ecology: BIO 281 or EEB 381			
<input type="checkbox"/> Genetics: BIO 305			
<input type="checkbox"/> Biochemistry: Choose from: MCDB 310, BIOLCHEM 415, or CHEM 351			
<input type="checkbox"/> Evolution: EEB 390, 391, or 392			

### Required Plant Biology Courses:

(Any course used to fulfill this requirement cannot also be used as an Elective Plant Biology Course; i.e., a course cannot "double-count.")

<input type="checkbox"/> Plant Biology: BIO 230			
<input type="checkbox"/> BIO 255 (Plant Diversity) or EEB 436 (Woody Plants)			
<input type="checkbox"/> MCDB 321 (Plant Physiology), or MCDB 430 (Plant Molecular Biology), or MCDB 433 (Plant Biochemistry)			

### Elective Plant Biology Courses:

(Any course used to fulfill this requirement cannot also be used as a Required Plant Biology Course; i.e., a course cannot "double-count.")

<input type="checkbox"/> Choose two courses from the Elective Plant Biology Course list (see attached); <u>at least one must be a lab</u> [indicated by an asterisk (*)].			
<ul style="list-style-type: none"> <li>• EEB/MCDB 300 or 400 (Independent Research), elected for a minimum of 3 credits in a single term and conducted in a <u>plant biology research lab</u>, may be used to fulfill the lab requirement. (3 credit max. applies; see CONSTRAINTS below.)</li> </ul>			

### Additional Courses:

<input type="checkbox"/> Choose additional Biology, EEB, or MCDB courses at the 200-level or above to reach 30 major credit hours.			
<ul style="list-style-type: none"> <li>• BIOLOGY 200, BIOLOGY 241, EEB/MCDB 301, EEB/MCDB 302, EEB/MCDB 800, MCDB 412, and non-specific (departmental) transfer credit are EXCLUDED.</li> <li>• The fourth course not taken under "Required General Courses" may be used here.</li> <li>• One cognate course, with advisor approval, may be used toward the major.</li> </ul>			

### CONSTRAINTS:

<ul style="list-style-type: none"> <li>• Prerequisites, introductory science courses, and non-specific (departmental) transfer courses are EXCLUDED from the 30 cr. required for the major.</li> <li>• <u>A maximum of 3 credits of independent research</u> (EEB/MCDB 300 or 400) may be counted toward the major.</li> </ul>			
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### Total Credits and GPA Requirement for Plant Biology:

<input type="checkbox"/> Minimum 30 cr. in Major			
<input type="checkbox"/> Minimum 2.0 GPA in Major: GPA is calculated from all mandatory prerequisites, all courses used for major requirements (including cognates), and all courses in BIOLOGY, EEB, and MCDB.			