Why study Biology?
"Pursuing a career in biology can be immensely rewarding and exciting. Studying biology teaches us to ask questions, make observations, evaluate evidence, and solve problems. Biologists learn how living things work, how they interact with one another, and how they evolve. They may study cells under a microscope, insects in a rainforest, viruses that affect human beings, plants in a greenhouse, or lions in the African grasslands. Their work increases our understanding about the natural world in which we live and helps us address issues of personal well-being and worldwide concern, such as environmental depletion, threats to human health, and maintaining viable and abundant food supplies." [from: http://www.aibs.org/careers]

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; General Biology; Cell and Molecular Biology; CMB:BME; Ecology and Evolutionary Biology; 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.

What courses should I take first?
The biological science introductory sequence consists of: BIOLOGY 171, BIOLOGY 172 or 174, and BIOLOGY 173. (Students with an appropriate AP score receive credit for BIOLOGY 195, which is the equivalent of BIO 171 & 172/174, but does NOT grant credit for 173.) Students should take 171 or 172/174 first and then follow with the second lecture course and 173.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIOLOGY 171</td>
<td>...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.</td>
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<tr>
<td>BIOLOGY 172 or 174</td>
<td>(prerequisite: prior or concurrent credit for CHEM 130) ...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.)</td>
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<tr>
<td>BIOLOGY 173</td>
<td>(prerequisite = BIOLOGY 171, 172, 174, or 195) ...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.</td>
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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. It is expected that the student will meet regularly with his or her mentor as well as gain exposure to the scientific literature of the field. 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 Plant Biology. In addition to completing all the requirements for the major, an honors degree requires a major GPA of at least 3.4, and the completion of a significant piece of independent research that is reported in an honors thesis and presented in a public forum. Refer to http://www.lsa.umich.edu/biology/academics/honorsprogram for detailed requirements.

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. Please refer to www.lsa.umich.edu/cgis for detailed information about options.

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, EEB, and MCDB courses. 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, EEB, or MCDB 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.

[Note: You are welcome to request review of a course before you take it. You will need to provide a detailed syllabus, so you 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.

- **Biology Student Alliance (BSA):** intended for Biology, CMB, Microbiology, Plant Biology, Neuroscience, and Biochemistry majors, as well as pre-med or science oriented students interested in learning more about MCDB-related topics. Email BSA-Board@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.
- **Neuroscience Students Association (NSA):** an organization for students with an interest in neuroscience. Email nsaleadteam@umich.edu for more information.
- **Society of Biology Students (SBS):** an informal group for students interested in Biology in general. Website: http://www.sitemaker.umich.edu/sbs/home or contact the Faculty Advisor, Robyn Burnham at rburnam@umich.edu for information.
- **Student Society for Stem Cell Research (SSSCR), University of Michigan – Ann Arbor Chapter:** an international network dedicated to the advancement of scientific research for cures. Website: www.umich.edu/~umsscr/index.html. Email ssscrexec@umich.edu.
COURSE LISTINGS for PLANT BIOLOGY DISTRIBUTION

Laboratory courses, or courses that include a laboratory, are marked with an asterisk (*)

- Choose at least two plant biology elective courses from the Elective Plant Biology Courses list (see below); at least one of these must be a lab course or a course with a lab component (indicated by an *).
- Three credits of EEB/MCDB 300/400 can be included and will count for laboratory credit as well, if earned in the same term and if the research is conducted in a plant biology research lab.
- A maximum of three credits of independent research may count towards the major. Library “research,” introductory biology laboratories, and UROP experience do not fulfill the requirement.
- A course used as a Required Plant Biology Course cannot also be used as an Elective Plant Biology Course (i.e., a course cannot “double-count”).

ELECTIVE PLANT BIOLOGY COURSES

EEB 372* General Ecology Laboratory
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 401 Advanced Topics (applicable sections only)
MCDB 406 Molecular Genetics of Plant Development
MCDB 413* Plant Molecular Biology Lab
MCDB 430 Plant Molecular Biology
MCDB 433 Plant Biochemistry

ADDITIONAL ELECTIVE COURSES

- Select additional Biology, EEB, or MCDB courses at the 200-level or above (except BIO 200, BIO 241, BIO 262, EEB/MCDB 301, EEB/MCDB 302, EEB/MCDB 800, or MCDB 412) to bring the major total to at least 30 credits.
- Majors are strongly encouraged to elect at least two credits of independent research and to enroll for a summer session at the UMBS.
- One cognate course, with advisor approval, may be elected.
- The fourth course not taken under “Required General Courses” may be used here.
PLANT BIOLOGY MAJOR REQUIREMENTS

PLANT BIOLOGY PREREQUISITES:

Introductory Biology Sequence:

☐ Choose Sequence A or B:
  A: BIO 171, 172 or 174, & 173
  B: BIO 195 (AP) & 173

Chemistry Sequence:

☐ CHEM 210 & 211
☐ CHEM 215 & 216

Quantitative Analysis Sequence:

☐ CALCULUS I: MATH 115, 120 (AP), or 185
☐ One course from: MATH 116, 121 (AP), 156, or 186; STATS 250; STATS 400-level or above (min. 3 credits); BIOLOGY 202; BIOPHYS/PHYSICS 290; EECS 203 or 280; EARTH 468; or other course with a MATH 115 prereq. chosen in consultation with 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:

☐ PHYSICS I (lecture + lab): PHYSICS 125, 135, 140 or 160 *and* the accompanying lab - PHYSICS 127, 136, 141, or 161. [PHYSICS 139 (AP) will satisfy this requirement.]
☐ PHYSICS II (lecture + lab): PHYSICS 126, 235, 240 or 260 *and* the accompanying lab - PHYSICS 128, 236, 241, or 261. [PHYSICS 239 (AP) will satisfy this requirement.]

PLANT BIOLOGY MAJOR:

Required General Courses: Select at least three of the four courses listed. (Note: The fourth course not used to fulfill this requirement may be taken as an additional elective.)

☐ Ecology: BIO 281 or EEB 381
☐ Genetics: BIO 305
☐ Biochemistry: Choose from: MCDB 310, BIOLCHEM 415, or CHEM 351
☐ Evolution: EEB 390, 391, or 392

Required Plant Biology Courses

☐ Plant Biology: BIO 230
☐ BIO 255 (Plant Diversity) or EEB 436 (Woody Plants)
☐ MCDB 321 (Plant Physiology), or MCDB 430 (Plant Molecular Biology), or MCDB 433 (Plant Biochemistry) [Note: Any course used to fulfill this requirement cannot also be used as an Elective Plant Biology Course; i.e., a course cannot “double-count”]

Elective Plant Biology Courses

☐ Choose two courses from Elective Plant Biology course list (see attached); at least one of these must be a lab course or a course with a lab component (indicated by an *).

Total Units and GPA Requirement for Plant Biology

☐ Minimum 30 cr. in Major
  • Choose additional BIOLOGY, EEB, and MCDB courses at the 200-level and above, EXCEPT FOR: BIO 200, BIO 241, BIO 262, EEB/MCDB 301, EEB/MCDB 302, EEB/MCDB 800, or MCDB 412, to reach 30 major credit hours.
  • One cognate course, with advisor approval, may be elected.
  • The fourth course not taken under “Required General Courses” above may be used here.
  • A maximum of three credits of independent research may count toward the major.

☐ 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 MCDB, EEB, and BIOLOGY.