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 General Biology?
General Biology is recommended for students who wish to pursue professional school (e.g., law school) or other non-biology-specific career options where knowledge of the natural sciences would be beneficial. It differs from the Biology major in that it requires fewer credits, less laboratory work, and has more breadth, particularly in the form of a non-science cognate course. 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 General Biology may not elect the following majors: Biology; Cell and Molecular Biology; CMB:BME; Ecology and Evolutionary Biology; Microbiology; Plant Biology; Neuroscience; Biochemistry; or Biomolecular Science. 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.

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<tr>
<th>BIOLOGY 171</th>
<th>BIOLOGY 172 or 174</th>
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<tr>
<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>
<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>
<th>BIOLOGY 173</th>
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<td>(prerequisite = BIOLOGY 171, 172, 174, or 195)</td>
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<tr>
<td>...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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</table>

What other types of classes are required?
General Biology requires introductory study in organic chemistry, physics, and calculus. These courses provide the foundational knowledge required for the advanced study of biology. Required courses within the program include genetics, biochemistry, and evolution, and all General Biology students obtain experience in a biology lab setting with the completion of at least two lab courses after BIO 173. The General Biology major encourages breadth in
the form of elective options, in addition to a “cognate” course requirement (a course from another department that explores a biology-related topic).

**How should I choose my electives? Are there concentrations or tracks within the major?**
There are no concentrations or tracks within the General Biology major, but the electives can be focused on a variety of interest areas. Please feel free to make an appointment with a General Biology advisor to discuss elective options.

**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](http://www.lsa.umich.edu/biology/studentresearch). If you have questions after reading through the guidelines, please stop in or make an appointment with a major advisor.

**What are the requirements for Honors?**
The General Biology major does not have an honors option. (Refer to [http://www.lsa.umich.edu/biology/academics/honorsprogram](http://www.lsa.umich.edu/biology/academics/honorsprogram) for detailed requirements for biology honors majors.)

**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](http://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](http://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](http://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](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/~umssscr/index.html](http://www.umich.edu/~umssscr/index.html). Email ssscrexec@umich.edu.
### Group I – MCDB focus
- BIO 205 (3) Developmental Biology
- BIO 207* (4) Introductory Microbiology
- BIO 225 (3) Principles of Animal Physiology (lecture)
- BIO 230* (4) Introduction to Plant Biology

*also satisfies lab req.

### Group II – EEB focus
- BIO 230* (4) Introduction to Plant Biology
- BIO 252* (4) Vertebrate Evolution and Diversity
- BIO 255* (4) Plant Diversity
- BIO 256 (4) Animals Functioning in Environments
- BIO 281 (3) General Ecology
- BIO 288* (4) Introduction to Animal Diversity
- EEB 381* (5) General Ecology (Su at UMBS)

### Biology & General Biology Labs (Note: A course taken at the U-M BioStation counts as a laboratory course.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIO 207 (4)</td>
<td>Introductory Microbiology</td>
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<tr>
<td>BIO 226 (2)</td>
<td>Animal Physiology Laboratory</td>
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<tr>
<td>BIO 230 (4)</td>
<td>Introduction to Plant Biology</td>
</tr>
<tr>
<td>BIO 252 (4)</td>
<td>Vertebrate Evolution and Diversity</td>
</tr>
<tr>
<td>BIO 255 (4)</td>
<td>Plant Diversity</td>
</tr>
<tr>
<td>BIO 288 (4)</td>
<td>Introduction to Animal Diversity</td>
</tr>
<tr>
<td>EEB/MCDB 300 (3)</td>
<td>Undergraduate Research</td>
</tr>
<tr>
<td>MCDB 306 (3)</td>
<td>Intro. Genetics Laboratory</td>
</tr>
<tr>
<td>MCDB 308 (3)</td>
<td>Developmental Biology Laboratory</td>
</tr>
<tr>
<td>EEB 320 (4)</td>
<td>Rivers, Lakes, and Wetlands</td>
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<td>EEB 330 (5)</td>
<td>Biology of Birds</td>
</tr>
<tr>
<td>EEB 348 (4)</td>
<td>Parasitology</td>
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<tr>
<td>EEB 348 (5)</td>
<td>Forest Ecosystems</td>
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<tr>
<td>EEB 372 (3)</td>
<td>General Ecology Laboratory [formerly BIO 282*]</td>
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<tr>
<td>EEB 381* (5)</td>
<td>General Ecology (Su at UMBS)</td>
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<tr>
<td>EEB 392 (5)</td>
<td>Evolution (Su at UMBS)</td>
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<tr>
<td>EEB/MCDB 419 (3)</td>
<td>Endocrinology Laboratory</td>
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<tr>
<td>MCDB 423 (3)</td>
<td>Cellular and Molecular Neurobiology Laboratory</td>
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</table>

### MCDB focus
- MCDB 424 (2) Behavioral Neurobiology Laboratory
- MCDB 429 (3) Cell and Molecular Biology Laboratory
- EEB 431 (5) Ecology of Animal Parasites (Su at UMBS)
- EEB 433 (4) Ornithology
- EEB 436 (4) Woody Plants
- EEB 441 (1) Biology of Fishes Laboratory
- EEB 442 (4) Biology of Insects
- EEB 443 (5) Biology of Insects (Su at UMBS)
- EEB 450 (5) Biology of Amphibians and Reptiles
- EEB 451 (4) Biology of Mammals
- EEB 453 (5) Field Mammalogy (Su at UMBS)
- EEB 455 (5) Ethnobotany (Sp at UMBS)
- EEB 457 (5) Algae in Freshwater Ecosystems (Su at UMBS)
- EEB 459 (4) Systematic Botany
- EEB 463 (3) Neotropical Plant Families
- EEB 466 (4) Biology of Fungi
- EEB 477 (5) Laboratory in Field Ecology
- EEB 482 (5) Limnology (Su at UMBS)
- EEB 485 (5) Limnology: Freshwater Ecology
- EEB 486 (5) Biology and Ecology of Fishes (Su at UMBS)
- EEB 489 (3) Soil Ecology
- EEB 493 (5) Behavioral Ecology (Su at UMBS)
- EEB 556 (5) Field Botany of Northern Michigan (Su at UMBS)

### GENERAL Biology Cognates (not approved for Biology)
- AMCLUT 241/BIOLOGY 241 – Health, Biology, and Society: What is Cancer?
- ANTHRCUL 344 – Medical Anthropology
- ENVIRON 256/ANTHRCUL 256 – Culture, Adaptation, and Environment
- EEB/MCDB 419 (3) Plant Molecular Biology Laboratory
- EEB/MCDB 424 (2) Behavioral Neurobiology Laboratory
- EEB/MCDB 429 (3) Cell and Molecular Biology Laboratory
- EEB/MCDB 431 (5) Ecology of Animal Parasites (Su at UMBS)
- EEB/MCDB 433 (4) Ornithology
- EEB/MCDB 436 (4) Woody Plants
- EEB/MCDB 441 (1) Biology of Fishes Laboratory
- EEB/MCDB 442 (4) Biology of Insects
- EEB/MCDB 443 (5) Biology of Insects (Su at UMBS)
- EEB/MCDB 450 (5) Biology of Amphibians and Reptiles
- EEB/MCDB 451 (4) Biology of Mammals
- EEB/MCDB 453 (5) Field Mammalogy (Su at UMBS)
- EEB/MCDB 455 (5) Ethnobotany (Sp at UMBS)
- EEB/MCDB 457 (5) Algae in Freshwater Ecosystems (Su at UMBS)
- EEB/MCDB 459 (4) Systematic Botany
- EEB/MCDB 463 (3) Neotropical Plant Families
- EEB/MCDB 466 (4) Biology of Fungi
- EEB/MCDB 477 (5) Laboratory in Field Ecology
- EEB/MCDB 482 (5) Limnology (Su at UMBS)
- EEB/MCDB 485 (5) Limnology: Freshwater Ecology
- EEB/MCDB 486 (5) Biology and Ecology of Fishes (Su at UMBS)
- EEB/MCDB 489 (3) Soil Ecology
- EEB/MCDB 493 (5) Behavioral Ecology (Su at UMBS)
- EEB/MCDB 556 (5) Field Botany of Northern Michigan (Su at UMBS)

### BIOLOGY Cognates (not approved for General Biology)
- AMCLUT 241/BIOLOGY 241 – Health, Biology, and Society: What is Cancer?
- CHEMISTRY – Any course numbered 230 or above
- EARTH 418 – Paleontology
- EARTH 437 – Evolution of Vertebrates
- ENVIRON 317 – Conservation of Biological Diversity
- ENVIRON 418/NRE 418 – Biology and Management of Insects
- HUMGEN 541 – Gene Structure and Regulation
- MICRBIOL/IMMUN 440 – Immunology
- MICRBIOL 405 – Introduction to Infectious Diseases
- MICRBIOL 415 – Virology
- MICRBIOL 460 – Eukaryotic Microbiology
- PHYSICS – Courses approved in advance by advisor
- PSYCH 331 – Biological Rhythms and Behavior
- PSYCH 337 – Hormones and Behavior
- PSYCH 530 – Advanced Topics in Evolutionary Comparative Psych.
- STATS 400 – Applied Statistical Methods
**GENERAL BIOLOGY MAJOR REQUIREMENTS**

**GENERAL BIOLOGY PREREQUISITES:**

**Introductory Biology Sequence:**

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<th>TERM</th>
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□ Choose Sequence A or B:
A: BIO 171, 172 or 174, & 173
B: BIO 195 (AP) & 173

**Chemistry Sequence:**

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□ CHEM 210 & 211

□ CHEM 215 & 216

**Quantitative Analysis Sequence:**

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□ 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:**

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<th>TERM</th>
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□ 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.]

**GENERAL BIOLOGY MAJOR:**

**Biology Group Options**

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□ Group I - MCDB Elective: Choose 1 from: BIO 205, BIO 207*, BIO 225, or BIO 230*

□ Group II - EEB Elective: Choose 1 from: BIO 230*, BIO 252*, BIO 255*, BIO 256, BIO 281, BIO 288*, or EEB 381*

**Required Courses**

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□ Genetics: BIO 305

□ Biochemistry: Choose from: MCDB 310, BIOLCHEM 415, or CHEM 351

□ Evolution: EEB 390, 391, or 392*

**Required Cognate**

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□ Choose one course from the General Biology Cognate list

**Lab Courses for General Biology**

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□ Lab Requirement (2 courses with labs are required, see list in dept.; one 3-credit election of MCDB/EEB 300/400 can be used; this req. OVERLAPS with other major reqs.) **Library research, Intro. Bio. labs, BIO 200, and UROP experience do not fulfill a lab requirement.**

**Total Units and GPA Requirement for General Biology**

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□ Minimum 24 cr. in Major

- Choose additional BIOLOGY, EEB, and MCDB courses at the 200-level and above, **EXCEPT FOR: BIO 241, BIO 262, EEB/MCDB 301, EEB/MCDB 302, EEB/MCDB 800, or MCDB 412, to reach 24 major credit hours; this requirement OVERLAPS with other major reqs.**
- Prerequisites and introductory science courses are excluded.
- A maximum of three credits of independent research from any combination of BIO 200 and EEB/MCDB 300 or 400 may be counted toward the major.

□ Minimum 2.0 GPA in Major

(GPA is calculated from all mandatory prerequisites, all courses used for major requirements, and all courses in MCDB, EEB, and BIOLOGY.)