



Biology Minor Requirements

Program in Biology Student Services

📍: 2200 Biological Sciences Bldg. (BSB)

🌐: <http://www.lsa.umich.edu/biology>

✉: lsa-biology-advising@umich.edu

☎: 734-763-7984

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 minor in Biology?

The minor in Biology offers students a coherent program of study and training in the biological sciences. It provides exposure to the fundamental principles of biology, including studies of the structure, organization, and diversity of life. The minor is well-suited for students who wish to pursue a career that requires an understanding and appreciation of the life sciences, though it is not intended for students interested in graduate work in biology.

Exclusions: Students who elect a minor in Biology may not elect the following majors: Biology; Biology, Health, and Society (BHS); Biotechnology & Bioenvironmental Sciences (BBS); Cellular and Molecular Biomedical Science (CMBS); Ecology, Evolution, and Biodiversity (EEB); Microbiology; Molecular, Cellular, and Developmental Biology (MCDB); Plant Biology; Neuroscience; or Biochemistry. They also may not elect a minor in Ecology and Evolutionary Biology.

How do I declare?

Students interested in any major or minor in the biological sciences are encouraged to meet with an advisor to discuss their academic plans as soon as possible! Students must have completed the introductory biology sequence, one term in residence with a major/minor GPA of 2.0 or better, and be in good academic standing in order to declare. Make an advising appointment online through the Program in Biology website: www.lsa.umich.edu/biology.

What courses should I take first?

The introductory biology 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. Students with an appropriate AP/IB score receive credit for BIOLOGY 196, which is the equivalent of BIOLOGY 173.
- Transfer students who receive credit for BIOLOGY 191 should take BIOLOGY 192 (offered in Fall terms only) and BIOLOGY 173 to complete the introductory biology sequence.

<u>BIOLOGY 171</u> ...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.	<u>BIOLOGY 172 or 174</u> (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.)
<u>BIOLOGY 173 (prerequisite = BIOLOGY 171, 172, 174, 191, or 195)</u> ...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.	

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. [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.] **At least 9 of the 15 credits required for a minor must be taken in-residence.**

See the LSA website for specific policies related to minors:

<https://lsa.umich.edu/lsa/academics/lsa-requirements/minors.html>

BIOLOGY LABS

BIO 202 Biological Data Analysis & Prog.

BIO 207 Microbiology

BIO 226 Animal Physiology Laboratory

BIO 230 Introduction to Plant Biology

BIO 252 Vertebrate Evolution and Diversity

BIO 288 Introduction to Animal Diversity

EEB/MCDB 300* (3) Undergraduate Research

MCDB 306 Intro. Genetics Laboratory

EEB 313 Geobiology

EEB 321 Rivers, Lakes, and Wetlands (UMBS)

EEB 330 Biology of Birds (UMBS)

EEB 348 Forest Ecosystems (UMBS)

EEB 372 General Ecology Laboratory

EEB 373 General Ecology Laboratory (UMBS)

EEB 391 Evolutionary Processes & Macroevolution

EEB 392 Evolution (UMBS)

EEB/MCDB 400* (3) Advanced Research

EEB 405 Biological Station Special Topics (UMBS)

MCDB 423 Cellular and Molecular Neurobio. Laboratory

MCDB 424 Behavioral Neurobiology Laboratory

MCDB 429 Cell and Molecular Biology Laboratory

EEB 429 Intro. to Statistical Model Building in R

EEB 431 Ecology of Animal Parasites (UMBS)

EEB 433 Ornithology

EEB 436 Woody Plants

EEB 441 Biology of Fishes Laboratory

EEB 443 Biology of Insects (UMBS)

EEB 447 Microbes in the Wild: Environ. Micro. Lab (UMBS)

EEB 450 Biology of Amphibians and Reptiles

EEB 451 Biology of Mammals

EEB 453 Field Mammalogy (UMBS)

EEB 455 Ethnobotany (UMBS)

EEB 457 Algae in Freshwater Ecosystems (UMBS)

EEB 468 Biology of Fungi

EEB 482 Limnology (UMBS)

EEB 486 Field Studies of Freshwater Fishes (UMBS)

EEB 489 Soil Ecology

EEB 493 Behavioral Ecology (UMBS)

EEB 496 Experimental Evolution

EEB 556 Field Botany of Northern Michigan (UMBS)

BIOLOGY MINOR REQUIREMENTS

BIOLOGY MINOR PREREQUISITES:

Introductory Biology Sequence:

Choose Sequence A, B, or C:

A: BIO 171; BIO 172 or 174; & BIO 173 or BIO 196 (AP/IB)

B: BIO 195 (AP/IB); & BIO 173 or BIO 196 (AP/IB)

C. BIO 191 (transfer credit); BIO 192; & BIO 173

TERM: **COURSE:** **GRADE:**

	TERM:	COURSE:	GRADE:
<input type="checkbox"/> Choose Sequence A, B, or C:			
A: BIO 171; BIO 172 or 174; & BIO 173 or BIO 196 (AP/IB)			
B: BIO 195 (AP/IB); & BIO 173 or BIO 196 (AP/IB)			
C. BIO 191 (transfer credit); BIO 192; & BIO 173			

BIOLOGY MINOR: Five courses totaling at least 15 credits, distributed as follows:

Core Courses: Select at least two of the four topics listed. (Courses with an asterisk (*) may overlap with the lab requirement.)

<input type="checkbox"/> Ecology: BIO 281 or BIO 282			
<input type="checkbox"/> Genetics: BIO 305			
<input type="checkbox"/> Biochemistry: MCDB 310, BIOLCHEM 415, or CHEM 351			
<input type="checkbox"/> Evolution: EEB 390, 391*, or 392*			

Lab or Field Course (This requirement may OVERLAP with other minor reqs.):

<input type="checkbox"/> Choose one laboratory or field course in BIOLOGY, EEB, or MCDB from the attached list.			
<ul style="list-style-type: none"> • EEB/MCDB 300 or 400, elected for a min. of 3 credits in one term, may be used to fulfill a lab requirement. (3 credit max. applies; see CONSTRAINTS below.) 			

Upper-Level Elective (May overlap with the lab requirement.):

<input type="checkbox"/> Choose one course in EEB or MCDB at the 300- or 400-level			
<ul style="list-style-type: none"> • Exclusions: EEB/MCDB 301, EEB/MCDB 302, BIO/EEB 312, EEB/MCDB 399, EEB/MCDB 499, MCDB 412, MCDB 461, and non-specific (departmental) transfer courses are EXCLUDED. • EEB/MCDB 300 or 400, elected for a min. of 3 credits in one term, may be used to fulfill this requirement. (3 credit max. applies; see CONSTRAINTS below.) 			

Additional Course(s):

<input type="checkbox"/> Choose additional BIOLOGY, EEB, or MCDB elective courses at the 200-, 300-, and 400-level, to reach 15 minor credit hours.			
<ul style="list-style-type: none"> • Exclusions: BIO 241, BIO 299, EEB/MCDB 301, EEB/MCDB 302, BIO/EEB 312, MCDB 412, MCDB 600, EEB/MCDB 800, and non-specific (departmental) transfer credit are EXCLUDED. 			

CONSTRAINTS:

<ul style="list-style-type: none"> • Prerequisites, introductory science courses, and non-specific (departmental) transfer courses are EXCLUDED from the 15 cr. required for the minor. • A maximum of 3 credits of independent research from any combination of BIO 200 and EEB/MCDB 300 or 400, et al., may be counted toward the minor. 			
--	--	--	--

Total Credits and GPA Requirement for Biology Minor:

<input type="checkbox"/> Minimum 15 cr. in Minor (minimum of five courses)			
<input type="checkbox"/> Minimum 2.0 GPA in Minor (GPA is calculated from all mandatory prerequisites, all courses used for minor requirements, and all courses in BIOLOGY, EEB, and MCDB.)			