BIOLOGY MAJOR

Department: Biology (https://catalog.bradley.edu/undergraduate/liberal-arts-sciences/biology/)

The Department of Biology offers a biology major leading to a baccalaureate degree with the possibility of receiving a concentration in Cell and Molecular Biology (https://catalog.bradley.edu/undergraduate/programs/biology-cell-molecular-biology-concentration/), Ecology and Evolutionary Biology (https://catalog.bradley.edu/undergraduate/programs/biology-ecology-evolutionary-biology-concentration/), Biology High School Education 9-12 (https://catalog.bradley.edu/undergraduate/programs/biology-education-912-concentration/), or Medical Technology (https://catalog.bradley.edu/undergraduate/programs/biology-medical-technology-concentration/). The major is designed for students interested in cell and molecular biology, ecology and evolutionary biology, environmental biology, biology education, medicine, dentistry, veterinary medicine, or medical technology. Separate specific majors for students interested in Biomedical Science (https://catalog.bradley.edu/undergraduate/programs/biomedical-science-major/), Environmental Science (Concentration in Biology (https://catalog.bradley.edu/undergraduate/programs/environmental-science-biology-concentration/) or Chemistry (https://catalog.bradley.edu/undergraduate/programs/environmental-science-chemistry-concentration/)) and Medical Laboratory Science (Clinical (https://catalog.bradley.edu/undergraduate/programs/medical-laboratory-science-clinical-concentration/) or General (https://catalog.bradley.edu/undergraduate/programs/medical-laboratory-science-general-concentration/) Concentration). The Department of Biology offers an accelerated 4+1 program (B.S./M.S.), Master of Science degree in Biology (https://catalog.bradley.edu/graduate/programs/master-science-biology/), and a minor in Biology (https://catalog.bradley.edu/undergraduate/programs/biology-minor/). They are also collaborating partners on the Neuroscience minor (https://catalog.bradley.edu/undergraduate/programs/neuroscience-minor/).

Undergraduate Course Requirements

All students majoring in biology, and those students desiring additional focus in one of the department's concentrations, must earn a grade of C or better in all required biology courses. All biology students must take the following core courses:

Code	Title	Hours
Required Core Courses		
BIO 150	Introduction to Biology	2.0
BIO 151	Molecules to Cells	3.0
BIO 152	Molecules to Cells Laboratory	1.0
BIO 250	Organismal Biology	4.0
BIO 251	Ecology, Evolution and Biodiversity	3.0
BIO 252	Ecology, Evolution and Biodiversity Laboratory	1.0
BIO 260	Biological Statistics I	1.0
BIO 261	Biological Statistics II	2.0
BIO 310	Genetics	3.0
BIO 311	Genetics laboratory	1.0
BIO 490	Biology Capstone	1.0
CHM 110	General Chemistry I	3.0
CHM 111	General Chemistry I Lab	1.0
CHM 116	General Chemistry II	3.0
CHM 117	General Chemistry II Laboratory	1.0
CHM 252	Organic Chemistry I	3.0
CHM 253	Organic Chemistry Laboratory I	2.0
CHM 256	Organic Chemistry II [1]	3.0
CHM 257	Organic Chemistry Laboratory II [1]	1.0
MTH 115	Brief Calculus With Applications I [2]	4.0
PHY 107	General Physics I	4.0
PHY 108	General Physics II	4.0

[1] CHM 256 Organic Chemistry II and CHM 257 Organic Chemistry Laboratory II are required for students in the cell and molecular biology concentration and recommended for others.

[2] MTH 116 Brief Calculus With Applications II highly recommended.

At the completion of 90 semester hours, the student must have credit for:

Code	Title	Hours
BIO 150	Introduction to Biology	2.0
BIO 151	Molecules to Cells	3.0
BIO 152	Molecules to Cells Laboratory	1.0
BIO 250	Organismal Biology	4.0
BIO 251	Ecology, Evolution and Biodiversity	3.0
BIO 252	Ecology, Evolution and Biodiversity Laboratory	1.0
BIO 260	Biological Statistics I	1.0
BIO 261	Biological Statistics II	2.0
CHM 110	General Chemistry I	3.0
CHM 111	General Chemistry I Lab	1.0
CHM 116	General Chemistry II	3.0
CHM 117	General Chemistry II Laboratory	1.0
CHM 252	Organic Chemistry I	3.0
CHM 253	Organic Chemistry Laboratory I	2.0
One semester of calculus		4.0

Students not meeting these requirements will not be allowed to enroll in other biology courses until requirements are met. Students with more than 30 semester hours transferring into biology programs from other Bradley majors must have a GPA of 2.25 or greater and must have completed at least one semester each of introductory biology, introductory chemistry, and calculus. Students with 30 or fewer hours will be assessed on a case-by-case basis.

In addition to the above requirements, each student must complete the requirements below with a grade of C or better in each biology course taken to graduate with a baccalaureate degree in Biology.

Students will choose a minimum of one course (with required laboratory) from each of the following categories.

Code	Title	Hours
Sub-Organismal		
BIO 312	Developmental Biology	4.0
BIO 314	Plant Development	4.0
BIO 381	Comparative Animal Physiology	3.0-4.0
BIO 464	Cell Biology	3.0-4.0
BIO 468	Immunology of Host Defense	3.0-4.0
BIO 484	Neurophysiology	3.0-4.0
BIO 503	Molecular Genetics	3.0-4.0
BIO 564	Advanced Cell Biology	3.0

BIO 568	Cellular and Molecular Immunology	3.0
Organismal		
BIO 323	Comparative Anatomy	4.0
BIO 324	Plant Diversity	4.0
BIO 334	Reproduction and Identification of Flowering Plants	4.0
BIO 361	Microanatomy	4.0
BIO 371	Invertebrate Zoology	4.0
BIO 406	General Microbiology	4.0
BIO 408	Bacterial Pathogenesis	3.0-4.0
BIO 417	Environmental Physiology	3.0-4.0
BIO 419	Ethology	4.0
BIO 506	Advanced Microbiology	3.0
BIO 508	Advanced Bacterial Pathogenesis	3.0
BIO 517	Environmental Physiology	3.0
BIO 519	Comparative Animal Behavior	3.0
BIO 530	Plant Systematics	3.0
Supra-Organismal		
BIO 420	Ecosystem Ecology	4.0
BIO 423	Freshwater Ecology	4.0
BIO 450	Conservation Biology	3.0
BIO 460	Ecology	4.0
BIO 463	Plant Ecology	4.0
BIO 520	Advanced Ecosystems Ecology	3.0
BIO 550	Conservation Biology	3.0
BIO 563	Advanced Plant Ecology	3.0
In addition, students must also take two additional courses (3-4 credit hours; lab is optional) from any course in the following list: [1]		
BIO 312	Developmental Biology	4.0
BIO 314	Plant Development	4.0
BIO 323	Comparative Anatomy	4.0
BIO 324	Plant Diversity	4.0
BIO 334	Reproduction and Identification of Flowering Plants	4.0
BIO 361	Microanatomy	4.0
BIO 371	Invertebrate Zoology	4.0
BIO 381	Comparative Animal Physiology	3.0-4.0
BIO 406	General Microbiology	4.0
BIO 408	Bacterial Pathogenesis	3.0-4.0
BIO 417	Environmental Physiology	3.0-4.0
BIO 419	Ethology	4.0
BIO 420	Ecosystem Ecology	4.0
BIO 423	Freshwater Ecology	4.0
BIO 440	Evolution	3.0
BIO 450	Conservation Biology	3.0
BIO 460	Ecology	4.0
BIO 463	Plant Ecology	4.0
BIO 464	Cell Biology	3.0-4.0
BIO 468	Immunology of Host Defense	3.0-4.0
BIO 475	Special Topics Biol	2.0-4.0
BIO 482	Endocrinology	3.0
BIO 484	Neurophysiology	3.0-4.0
BIO 502	Biometry	3.0
BIO 503	Molecular Genetics	3.0-4.0
BIO 505	Topics in Bioethics	3.0
BIO 506	Advanced Microbiology	3.0
BIO 508	Advanced Bacterial Pathogenesis	3.0
BIO 509	Human Genetics	3.0
BIO 517	Environmental Physiology	3.0
BIO 519	Comparative Animal Behavior	3.0
BIO 520	Advanced Ecosystems Ecology	3.0
BIO 525	Advanced Physiology	3.0
BIO 526	Advanced Pathophysiology	3.0
BIO 527	Physiology of Anesthesia	3.0
BIO 530	Plant Systematics	3.0
BIO 540	Evolution	3.0
BIO 550	Conservation Biology	3.0
BIO 563	Advanced Plant Ecology	3.0
BIO 564	Advanced Cell Biology	3.0
BIO 568	Cellular and Molecular Immunology	3.0
BIO 575	Special Graduate Topics in Biology	2.0-3.0

[1] Students may take 3 hours of BIO 485 Research in lieu of one of these required courses.

The Biology Department offers the opportunity for a student to receive one of several concentrations that will allow students to concentrate or specialize in various areas that will better prepare them for their post-graduate careers. Specifically, the department offers concentrations in cell and molecular biology (https://catalog.bradley.edu/undergraduate/programs/biology-cell-molecular-biology-concentration/), ecology and evolutionary biology (https://catalog.bradley.edu/undergraduate/programs/biology-ecology-evolutionary-biology-concentration/), secondary teaching (https://catalog.bradley.edu/undergraduate/programs/biology-education-912-concentration/), and medical technology (https://catalog.bradley.edu/undergraduate/programs/biology-medical-technology-concentration/).