Biology

Contact Information

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Departmental Goals and Objectives

The B.S. degree in Biology is designed to augment student learning, build a broad foundational understanding of biological sciences, create relevant competencies in scientific practices, and develop critical-thinking and problem-solving skills to address current scientific issues.

The degree includes a broad curriculum with biology courses and integral supporting disciplines; this allows flexibility for students and their advisors to construct a degree that prepares the student for a variety of fields of interest in the biological sciences. The curriculum is delivered by faculty with diverse interests, providing opportunities to participate in research in many areas including molecular, cellular, organismal and ecological fields of study.

With a foundational curriculum and research opportunities available, the B.S. degree prepares students to continue their careers in biological sciences in industry, government, or academia. Graduates from UIS with a B.S. in Biology have entered their professional careers as laboratory and field technicians, scientific sales representatives, biology project managers, and secondary teachers. Other graduates have successfully continued their academic careers in graduate school and professional schools for medicine, dentistry, physical therapy, pharmacy, and veterinary medicine.

Honors in Biology

Biology majors with a cumulative GPA greater than 3.5 at UIS may elect to participate in the Biology Honors option. In addition to Biology Program and UIS requirements, honors students must maintain a minimum cumulative GPA of 3.5, and successfully complete BIO 400 ECCE: Undergraduate Research with a research advisor. Students must also present their undergraduate research findings in a public presentation (e.g., Student Technology, Arts & Research Symposium - STARS). Students must apply for participation in the honors program to the program lead, and obtain the approval of their faculty research advisor.

Internships and Undergraduate Research

Students can gain practical professional experience by participating in an internship through the Internships and Prior Learning (IPL) programs. Placements have included state agencies such as the Illinois State Museum, Illinois Environmental Protection Agency, Illinois Department of Natural Resources as well internships at SIU School of Medicine, Lincoln Memorial Garden, or local Veterinary Clinics. Students may also conduct research with Biology faculty members (BIO 400 ECCE: Undergraduate Research). These experiences can count toward a student's ECCE Engagement requirements. Please note that courses can only count toward fulfillment of one requirement. BIO 400 can be used as either ECCE Engagement or a BIO elective, but the same credits cannot be used for both. A student can take four credits of BIO 400 as elective and an additional three credits of BIO 400 for ECCE Engagement if they want to fulfill both requirements through a research experience (seven credits total).

The Bachelor's Degree

- Pre-Medical Concentration
- Science of the Environment Concentration

Advising

Students with junior and senior standing should meet with the College of Health, Science, and Technology advisor before initial registration. The student should prepare a plan to ensure that all requirements are being met and discuss this plan with the college advisor. The program recommends that students take as many introductory courses (see below) as possible their freshman and sophomore year. BIO 301, CHE 267, and CHE 268 should be taken no later than spring of their junior year.

Students are expected to complete the first semester of organic chemistry before taking cell biology. Core Courses (see below) BIO 311, BIO 371, BIO 381, BIO 391 and BIO electives should be started in the junior year with emphasis on those core courses that serve as pre-requisites for future BIO electives of interest. In the senior year, students can take any remaining BIO electives and Core Courses. Pre-professional students (pre-med, pre-vet, pre-pharmacy, pre-dental) should meet with an advisor when planning their program.

Grading Policy

To be able to enroll in upper division courses, students must earn at least a C or better in BIO 141 and BIO 142. To earn a Biology degree, students must have at least a C (2.0) average in all required courses (including biology electives). Because writing is a core skill for biologists, students must earn at least a C to receive credit in BIO 301. Those performing below this level (C- or lower) are required to retake the course. Transfer courses must have a grade of C or better (grades of C- or lower will not be accepted).

Program Learning Outcomes

Upon graduating, students should be able to:

- Design and conduct a scientific study to investigate biological systems.
- Articulate and apply the concepts of cellular biology, organismal biology, ecology and evolution.
- Explain the molecular basis of heredity and the processes of biological evolution.
- Integrate the knowledge they have obtained across their biology course work to address applied issues.
- Communicate effectively in written and oral scientific formats.

Students declaring the BIO major complete eight semester hours in general chemistry with laboratory, seven semester hours in organic chemistry with laboratory, eight semester hours of biology courses

(typically general biology with laboratory), and one course in statistics. The general chemistry and general biology courses taken need to be the introductory sequence for science majors. Up to 12 semester hours of approved lower-division courses may be transferred from an accredited institution of higher education to make up deficiencies.

Requirements

Introductory Courses (for core course work) [1]		
BIO 141	General Biology I	4
BIO 142	General Biology II	4
CHE 141	General Chemistry I	4
CHE 142	General Chemistry II	4
CHE 267 & CHE 268	Organic Chemistry I and Organic Chemistry I Laboratory	4
CHE 269	Organic Chemistry II	3
MAT 121	Applied Statistics	3
Total Hours		**26**

[1] One semester of organic chemistry is a prerequisite for some biology core courses. Transfer students with credit equivalent to CHE 267 and CHE 268 can substitute general electives.

Core Requirements		
BIO 301	General Seminar (sophomore or junior year)	3
BIO 311	Cell Biology (offered in spring, junior or senior year)	4
BIO 371	Principles Of Ecology (offered in fall, junior or senior year)	4
BIO 381	Genetics (offered in spring, junior or senior year)	4
BIO 391	Evolution (senior year preferred)	4
BIO 401	Integrative Biology: Senior Seminar (final semester)	3
BIO Electives (300 and 400 Level BIO courses, at least 2 lab courses) [1]		14
Total Hours		**36**

[1] BIO Electives: BIO 306 and BIO 307 do not count towards the BIO elective. All 500 level BIO courses as well as ENS 404, MPH 471, PSY 412, and TEP 437 count towards the BIO elective. Students should ask the advisor for current list of courses. At least two courses out of the 14 BIO electives credit must be lab courses.

NOTE:

Pre-professional students (pre-med, pre-vet, pre-pharmacy, pre-dental) and students planning to go to graduate school should take a year of physics with laboratory (ASP 191 and ASP 192 or ASP 201 and ASP 202). Calculus is required for the ASP 201 and ASP 202 course sequence. These students should also take the laboratory associated with the second semester of Organic Chemistry CHE 271.

Minors

The minor in Biology is designed for students who wish to increase their knowledge of biology, acquire a foundation in biological sciences, and develop critical thinking skills. Students may plan a broad-based minor, containing courses from each of the major organizational divisions of living things: cells, organisms, and communities. The minor may also focus on a particular aspect of biology such as botany, ecology, or molecular biology.

To earn a Biology minor, students must complete a minimum of 24 hours in biology, of which at least eight hours must be upper-division courses taken at UIS. It is recommended that electives be selected in consultation with a biology faculty member or advisor. Some upper-division courses have particular prerequisites other than general biology, please check with an advisor.

NOTE:

A minimum of eight hours of upper-division course work must be taken at UIS. Some upper-division courses have particular prerequisites other than general biology.

Requirements

Core Courses		
BIO 141	General Biology I [1]	4
BIO 142	General Biology II	4
Elective Courses		
Select from the following:		**16**
BIO 311	Cell Biology	
BIO 371	Principles Of Ecology	
BIO 381	Genetics	
BIO 391	Evolution	
BIO 400	ECCE: Undergraduate Research	
BIO 402	Biometrics	
BIO 410	Topics in Biology	
BIO 428	Human Disease	
BIO 429	Human Physiology	
BIO 431	Human Anatomy	
BIO 433	Comparative Vertebrate Biology	
BIO 444	Aquatic Ecology	
BIO 445	Biology Of Water Pollution	
BIO 446	Restoration Ecology	
BIO 447	Global Change Ecology	
BIO 448	Introduction to Immunology	
BIO 449	Introductory Immunology Lab	
BIO 451	General Botany	
BIO 455	Medical Botany	
BIO 462	Conservation Biology	
BIO 475	General Biochemistry	
BIO 476	General Biochemistry Laboratory	
BIO 485	Advanced Biochemistry	
Total Hours		**24**

[1] Equivalent courses are accepted