

BIOLOGY, BS

Contact

Academic Support Coordinator
114 Life Sciences Complex
biougrad@syr.edu, 315-443-9139

Faculty

Yasir Ahmed-Braimah, David M. Althoff, Jason Boock, Carlos A. Castañeda, Heather D. Coleman, Jen Cook, Steve Dorus, Scott E. Erdman, Christopher W. Fernandez, Sarah E. Hall, Heidi Hehnly, James A. Hewett, James Hougland, Li-En Jao, Eundeok Kim, L. Jamie Lamit, Katharine Lewis, Chih Hung Lo, Sarah K. Lucas, Jessica MacDonald, Lauren Mavica, Vera McIlvain, Heather Meyer, Allison D. Oakes, Angela Oliverio, Susan E. Parks, Melissa E. Pepling, Scott Pitnick, Ramesh Raina, Surabhi Raina, Jayson Smith, Julia Snyder, Roy D. Welch, Michele G. Wheatly, and Jason R. Wiles

Students majoring in biology establish a general background in the discipline through a series of first-year/sophomore-level core courses that preview the major sub-disciplines of biology. This introductory program is followed by courses that allow the student to focus on more advanced material.

The major in biology leads to either the B.A. or the B.S. degree. The B.S. degree is intended for students interested in graduate study in biological science or the health professions (medicine, dentistry, or veterinary medicine). In addition to biology requirements, students pursuing a B.S. degree take general chemistry, organic chemistry, and calculus. Students pursuing the B.S. degree are also able to personalize their curriculum with elective courses in one of five tracks: Biological Sciences; Ecology and Environmental Science; Genetics, Genomics, and Evolution; Integrative and Biomedical Sciences; and Molecular, Cellular, and Developmental Biology. Students are also encouraged to gain practical experience and academic credit through the University.

The B.S. degree is intended for students who wish to pursue technical or science-related careers that do not require a graduate or professional degree, or careers outside of biology in which a background in science may be useful, such as science writing, business, or law. Although the first-year/sophomore-level core biology course requirements for the B.A. and the B.S. degrees are similar, there are key differences. The B.A. degree requires fewer courses in chemistry, mathematics, and upper division Biology.

Student Learning Outcomes

1. By the end of their first year, students will be able to recognize and distinguish theories, concepts and principles, as defined by the Vision and Change core from the major sub-fields of biology including molecular, cellular and developmental biology; physiology; and ecology and evolution.
2. By the end of their second year, students will be able to analyze, synthesize and apply theories, concepts and principles, as defined by the Vision and Change core, from the major sub-fields of biology listed above.
3. By the end of their degree, students will be able to analyze and synthesize more specific and advanced concepts and demonstrate implicit knowledge and understanding in at least one major sub-field of biology (specific outcomes defined by the track of study).

4. Apply skills in biological research and demonstrate knowledge of the nature and practice of science.
5. Apply communication/collaboration skills relevant to biological sciences.
6. Apply quantitative reasoning and methods to solve problems in the biological sciences.
7. Describe the relationship between science and society; identify ways that this has had both positive and negative impacts.

Major Requirements

B.S. Degree Requirements (58 to 60 credits)

To Declare the B.S. Major in Biology

A student may declare the B.S. major in Biology during the admission process or anytime thereafter by contacting the Academic Coordinator of the Biology Department.

Students cannot double major in biotechnology, biochemistry or biology. They cannot complete a minor in biology in conjunction with one of those three programs.

Code	Title	Credits
Core Courses		
All core courses should be completed by the end of a student's sophomore year.		
BIO 121	General Biology I	3
BIO 122	General Biology I Laboratory	1
BIO 123	General Biology II	3
BIO 224	Integrative Biology Laboratory	2
BIO 322	Cell and Molecular Biology	4
BIO 323	Integrative Physiology and Ecology	4
BIO 324	Evolution	4
BIO 224 cannot be omitted nor substituted. No transfer credit petitions will be accepted for BIO 224.		

Upper-Division Courses

Students in the B.S. program complete an additional 18 credits of upper-division coursework in Biology in a specific track. Of the 18 credits, students must take: (a) the foundation course for their chosen track; these courses consist of BIO 316 / BIO 317 - Anatomy and Physiology I/II BIO 326 - Genetics, BIO 328 - Cell and Developmental Biology or BIO 351 - Ecology; (b) 9 credits of electives; and (c) 6 credits of laboratory courses. Students may complete 6 lab credits through any combination of laboratory courses offered in their chosen track, with the following restrictions to ensure breadth: only one of the anatomy-related courses (BIO 316 - Anatomy and Physiology I for Biology Majors, BIO 317 - Anatomy and Physiology II for Biology Majors, or BIO 482 - Neuroanatomy Lab) may count toward the lab requirement, and only one of the microscopy-related courses (BIO 483 - Basic Microscopy Lab or BIO 484 - Quantitative Fluorescence Microscopy Lab) may count toward the lab requirement. Regarding electives, one upper division course must include a significant focus on communication skills experience and one upper division elective or lab course may be taken from another track without requiring a petition.	18
---	----

Math and Chemistry Requirements

The B.S. degree in Biology requires: (1) CHE 106/CHE 107 – General 19-21 Chemistry with Lab and CHE 116/117 – General Chemistry II with lab; (2) CHE 275/CHE 276 – Organic Chemistry with lab; and (3) one semester of calculus and MAT 221 Elementary Probability & Statistics I or a 300 to 500-level statistics course.

Total Credits

58-60

College of Arts and Sciences Requirements

For all Arts and Sciences|Maxwell students, successful completion of a bachelor's degree in this major requires a minimum of 120 credits, 96 of which must be Arts and Sciences|Maxwell credits, completion of the Liberal Arts Core (<https://coursecatalog.syracuse.edu/undergraduate/arts-sciences/>) requirements, and the requirements for this major (30 credits) that are listed above.

Dual Enrollments:

Students dually enrolled in **Newhouse*** and Arts and Sciences|Maxwell will complete a minimum of 122 credits, with at least 90 credits in Arts and Sciences|Maxwell coursework and an Arts and Sciences|Maxwell major.

*Students dually enrolled in the College of Arts and Sciences|Maxwell as first year students must complete the Liberal Arts Core (<https://coursecatalog.syracuse.edu/undergraduate/arts-sciences/>). Students who transfer to the dual program after their first year as singly enrolled students in the Newhouse School will satisfy general requirements for the dual degree program by completing the Newhouse Core Requirements.

Undergraduate University Requirements

The following requirements and experiences apply to all Syracuse University Undergraduate matriculated degree programs.

- IDEA Course Requirement (<https://coursecatalog.syracuse.edu/undergraduate/university-requirements/idea-course-requirement/>)
- First Year Seminar (<https://coursecatalog.syracuse.edu/undergraduate/university-requirements/first-year-seminar/>)