

# BIOLOGY: B.S.

*This program will begin Spring 2025.*

Biology is the study of living things, from cells and their molecules to organisms and the ecosystems that they live in. The Bachelor of Science in Biology is a 120-credit program that includes foundational coursework in Biology, Chemistry, Physics, and Math. The program includes both required and elective advanced level Biology courses, which allow students to reinforce and expand their knowledge in the field.

Biology is a broad and varied scientific discipline and, as such, lays a foundation for a multitude of career paths. Students with a degree in Biology may seek employment in education; academic, clinical, or research fields; environment and ecology-related fields; and allied health science professions. Additionally, a Biology degree can serve as the foundation for future graduate studies in a variety of occupations.

## Program Details

Students pursuing a B.S. program in Biology must complete the following courses:

Code	Title	Credits
BIOL 1210 & BIOL 1211 or BIOL 1200	Biology I: Lecture and Biology I: Laboratory Biology I with Lab	4
BIOL 1212 & BIOL 1213 or BIOL 1201	Biology II: Lecture and Biology II: Laboratory Biology II with Lab	4
CHEM 1210 & CHEM 1211 or CHEM 1205	Chemistry I: Lecture and Chemistry I: Laboratory Chemistry I with Lab	4
CHEM 1212 & CHEM 1213 or CHEM 1206	Chemistry II: Lecture and Chemistry II: Laboratory Chemistry II with Lab	4
PHYS 1210 & PHYS 1211 or PHYS 1200	Physics I: Lecture and Physics I: Laboratory Physics I with Lab	4
PHYS 1212 & PHYS 1213 or PHYS 1201	Physics II: Lecture and Physics II: Laboratory Physics II with Lab	4
MATH 1065	Statistics	4
MATH 2140	Calculus I	4
CHEM 3210	Organic Chemistry I with Lab	4
BIOL 3204	Genetics	4
BIOL 3206	Cell Biology	4
BIOL 3302	Evolution	4
BIOL 3800	Bioethics	4
2 Additional Upper Level BIOL Electives		8

## Biology Program Notes:

1. BIOL 1210 and BIOL 1212 can be replaced with the three-course sequence: BIOL 1204 Introduction to Cell Biology and Genetics, BIOL 1205 Introduction to Organismal Biology, and BIOL 1206 Introduction to Population Biology. BIOL 1211 Biology I Laboratory and Biology 1213 II Laboratory must still be taken.

2. Students who have taken Organic Chemistry I with Lab at a lower level at a different institution may use it to meet the Organic Chemistry I with Lab requirement here at SUNY Empire.
3. Students who need a refresher in foundational mathematics before taking Physics and Calculus should consider taking MATH 1040 Algebra and/or MATH 1140 Precalculus.
4. Students transferring in lower level coursework that overlaps content covered in BIOL 3204, 3206, or 3302 may count that lower-level work as satisfying the upper-level content requirements. However, students must have a minimum of 24 advanced level credits in Biology (or other approved areas), so additional upper level Biology electives must be taken.
5. BIOL 3800 Bioethics provides students with a framework to assess ethical issues in Biology, as well as an opportunity to reflect on their future roles in the field. It is recommended that students take BIOL 3800 Bioethics as soon as Biology I and II are completed.
6. An upper level BIOL elective can be met with a BIOL 3XXX or 4XXX course. A full list of BIOL course offerings can be found in the course catalog. CHEM 3400 Biochemistry, HSCI 4200 Epidemiology and ENSC 4202 Biogeography are also courses that can be used to meet the upper level Biology elective requirement.

## Learning Outcomes

- Describe the foundational concepts and fundamental laws in Biology.
- Use reasoning and problem-solving skills to critically read scientific texts, evaluate for competing hypotheses, and assess experimental design.
- Employ laboratory skills and the scientific method to formulate hypotheses, run experiments to test their hypotheses, and analyze and interpret the results.
- Communicate biological concepts from literature or their own laboratory research through reports, essays, and presentations.
- Identify evolution as one of the central theories of biology that explains the unity and diversity of life, as well its importance in the classification of living things.
- Identify the importance of scientific integrity, ethical research, and applications of biology to science policy and society as a whole.