

Biology

Bachelor of Arts and Bachelor of Science

1. Demonstrate a solid knowledge base in the following central areas of biology: biodiversity, cell biology, ecology, evolution, genetics, physiology, one or more elective areas, and related areas of inorganic and organic chemistry, physics, and mathematics.
2. Describe in detail the major unifying themes of biology, such as evolution, energy flow and transformation, homeostasis, genetic information storage and utilization, structure-function relationships, and hierarchies of organization.
3. Apply the scientific method, including the roles of inductive and deductive logic, and the applications and limitations of the scientific method, to design and evaluate experiments.
4. Generate hypotheses on the basis of observation and design experiments using appropriate technology to test these hypotheses in the laboratory and in the field.
5. Analyze and interpret quantitative biological data using statistical methods.
6. Communicate scientific information through written work in a variety of formats, and through oral presentation.
7. Discuss the relevance of scientific research to society from a historic and a modern perspective, including the ethical implications of scientific research and of new technology.
8. Find, read, understand, critically evaluate, summarize, and use information in the scientific literature.
9. Demonstrate extensive depth of knowledge in at least one area of specialization in modern biology through coursework. (BS only)
10. Demonstrate advanced and sophisticated laboratory skills in at least one area of specialization in modern biology through completion of laboratory coursework or through completion of a research project. (BS only)

Master of Science

1. Critically read and comprehend original research papers in biology
2. Write manuscripts describing experimental results in the standard format for submission to scholarly journals
3. Apply appropriate statistical analyses to experimental design and results
4. Use a variety of modern scientific instruments and describe the theoretical bases, applications, and limitations of the instruments

5. Make oral presentations in acceptable formats describing information in the scientific literature and describing personal research projects
6. Apply the scientific method to answer questions in biology through the design and conduct of hypothesis-driven experimental research projects
7. Demonstrate a thorough and sophisticated knowledge base in cell and molecular biology and describe in detail the current knowledge in at least one specialized field of the biological sciences