

General Course Learning Outcomes

Fall 2025

Biology 151

1. Relate the structures of cellular components, such as water, ions, organic chemicals, macromolecules, membranes, and prokaryotic and eukaryotic organelles, to their functions.
2. Outline processes and transformations that cells use to store and release energy via chemical reactions, enzymes, membranes, and the pathways of respiration, fermentation, and photosynthesis.
3. Demonstrate how chromosomal DNA stores and replicates information and uses it to direct the synthesis of RNA and proteins.
4. Model the relationships between chromosomal behavior, genetic information, and physical traits, and predict how information is transmitted during prokaryotic and eukaryotic reproduction.
5. Relate cellular, tissue, and organ structures and processes to their functions in animal physiology and homeostasis, including nervous and endocrine systems, respiration and circulation, digestion and nutrition, and osmoregulation.
6. Identify and investigate scientific problems by interpreting the results of prior research, developing hypotheses, designing and conducting experiments, analyzing data, and planning future experiments.
7. Demonstrate skills necessary for biological research, including effective teamwork, data collection methods, and scientific communication.
8. Integrate concepts and content from biology and other scientific disciplines to explore current global and societal issues.

Biology 152

1. Explain the key mechanisms underlying biological evolution and identify those that drive diverse adaptations and key transitions in the history of life on Earth.
2. Relate cellular, tissue, and organ structures and processes to their physiological functions in the plant life cycle to explain how plants acquire and use energy and material resources and respond to environmental stimuli.
3. Describe the structure and function of ecological systems at different spatial and temporal scales and how abiotic and biotic factors affect the distribution of species.
4. Assess how humans impact biological systems through habitat fragmentation and loss, climate change, overexploitation, invasive species, and pollution.

5. Apply vocabulary, concepts, and theories of plant physiology, evolution, and ecology to problems across the biological sciences.
6. Identify and investigate scientific problems by interpreting the results of prior research, developing hypotheses, designing and conducting experiments, analyzing data, and planning future experiments.
7. Demonstrate skills necessary for biological research, including effective teamwork, data collection methods, and scientific communication.
8. Integrate concepts and content from biology and other scientific disciplines to explore current global and societal issues.