## **BIOLOGY, B.S. (ABINGTON)**

Begin Campus: Any Penn State Campus

End Campus: Abington

## **Program Learning Outcomes**

- 1. Students will be able to describe how heritable changes can lead to differences in populations over time that might result in speciation; trace energy/matter transformation, storage, and mobilization; explain how information is exchanged and stored; recognize how changes in biological structures can have varying effects on function; and/or describe the interactions and interconnections among systems across biological scales and over evolutionary time scales.
- 2. Students will be able to apply the elements of the process of science such as posing questions, generating novel hypotheses based on the scientific literature; developing appropriate technical skills for research; designing/conducting experiments to test hypotheses in laboratory and/or field settings; summarizing/interpreting data; integrating/evaluating findings in the broader scientific field to construct new knowledge; and/or participating in the peer review/ revision process.
- Students will be able to discriminate among scientific claims
  presented in a variety of sources based on the strength of evidence;
  find appropriate published scientific literature; and/or analyze and
  critically evaluate data/conclusions from the scientific peer-reviewed
  literature.
- 4. Students will be able to apply basic quantitative competencies such as algebra, probability, statistics, unit conversions, and fundamental biological equations; organize, summarize, and interpret quantitative data; use modeling/simulation to approach problems from across various scales; and/or find and analyze large databases using statistical methods and/or other approaches.
- 5. Students will be able to integrate knowledge among biological subfields and between biology and other disciplines.
- 6. Students will be able to engage with diverse communities and leverage the skills in the community to pose and solve biological questions; demonstrate the ability to work in teams to solve biological problems; and/or communicate in a variety of formal and informal ways in the discussion of biological research.
- 7. Students will explore the impacts of scientific research on society and the environment and how society influences/relies on research to inform decision-making; evaluate the ethical implications of biological research; recognize ethical issues in a variety of settings; and/or describe how different perspectives and the resulting alternative approaches might be evaluated using ethical principles to identify a solution to an issue.
- Students will be able to communicate in a professional manner and learn/use professional behaviors in all aspects of college and career building activities, including participation in opportunities such as research, internships, cooperative education, teaching and tutoring, study abroad, and/or volunteer work.