BIOLOGY, B.S. (SCIENCE)

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Learning Outcomes

1. KEY LITERACIES: 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. PROCESS OF SCIENCE: 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

3. SCIENTIFIC EVIDENCE EVALUATION: 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. QUANTITATIVE REASONING AND DATA SCIENCE: 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. INTERDISCIPLINARY THINKING: integrate knowledge among
biological subfields and between biology and other disciplines

6. COLLABORATION AND COMMUNICATION: 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. SCIENCE AND SOCIETY: 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

8. PROFESSIONAL EXPERIENCES: 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