

PORTLAND STATE UNIVERSITY BIOLOGY MAJOR LEARNING OUTCOMES

1. **Content.** Students will be able to explain and apply fundamental concepts of the biological sciences including:
 1. Microbiology, Biochemistry, Cell and Molecular Biology, Genetics
 2. Physiology and Organismal Biology
 3. Ecology and Evolution
2. **Processes of Scientific Inquiry and the Scientific Method.** Students will be able to conduct the processes of science by:
 1. **Sources of Information.** Identifying and accessing information (from primary literature and other relevant works) for a particular topic and evaluating the scientific content and context of these sources. Also, students should understand how the peer-review process works and its importance.
 2. **The Scientific Method.** Generating novel and testable scientific questions, formulating testable hypotheses, and identifying measurable predictions based on observations or previous research.
 3. **Data Collection and Analysis.** Designing and implementing observational or experimental approaches to collect relevant data, and employing appropriate analytical approaches to analyze those data.
 4. **Evaluation.** Interpreting data and/or observations to support or refute hypotheses, draw conclusions, put findings in the context of current scientific knowledge and literature, and identify future avenues of research.
3. **Communication.** Students will learn to effectively communicate scientific information through various modes (i.e., written, oral, graphical, multimedia-based), using language that is appropriate for scientific professionals and the public, in a variety of different societal contexts.
4. **Critical Thinking.** Students will be able to demonstrate critical thinking by:
 1. **Synthesis.** Integrating and analyzing information within and across spatial and temporal scales as well as levels of biological organization.
 2. **Metacognition.** Identifying, reflecting upon, and evaluating assumptions and biases in science.
5. **Societal Relevance.** Students will evaluate the relationship between science and society through:
 1. **Science Literacy.** Justifying the importance of science and science literacy for individuals and society.
 2. **Impact and Access.** Explaining how biases and societal factors affect the processes of science (and vice versa), and the differential outcomes and impacts (both positive and negative) of science on individuals. Being given tools to assess how access to participation in science may differ among different demographic groups.
6. **Professionalism.** Students will demonstrate that they are ready to enter a career by:
 1. **Ethics.** Articulating their personal code of ethics.
 2. **Collaboration.** Understanding the importance of effective and appropriate forms of collaboration.

3. **Acknowledgement.** Ensuring proper acknowledgement of others' work, language and ideas.

Career Planning. Engaging in self-assessment of interpersonal and academic behaviors needed to achieve their individual career goals.