

## University of Wisconsin-Parkside Biological Sciences Learning Outcomes

The goal of the Biological Sciences Department at the University of Wisconsin-Parkside is to expand and strengthen educational opportunities for undergraduates at the cutting edge of our discipline. We seek to foster scientists and citizens that understand the scope and perspective of modern biology. Our graduates receive excellent preparation for advanced work in the sciences, for professional careers in health science, and for good citizenship in a society increasingly affected by and dependent on modern science and technology. These learning outcomes are consistent with and reinforce UW System Learning Outcomes: knowledge of the natural world; critical thinking skills; effective communication skills; and Individual, social, and environmental responsibility.

Students completing a B.S. in Biological Sciences at University of Wisconsin-Parkside will achieve *specific learning outcomes* in the undergraduate program that include the following:

1. **Biological Complexity:** Biology is concerned with complex systems that are the result of evolution. We expect students to develop a sophisticated appreciation of the nature of living organisms and biological processes. Students can accomplish this goal through introductory courses that emphasize an evolutionary perspective on organismal structure and function and organismal diversity as reflecting the evolutionary history of life on earth (**BIOS 101, 102**).
2. **Inquiry:** Besides encompassing a body of facts and theories, biology is a multi-faceted process of inquiry. Students are expected to develop analytical and critical thinking skills, including hypothesis generation and testing early in their coursework (**BIOS 210**).
3. **Heredity & Evolution:** Students are expected to know about the mechanisms of heredity, and the crucial role they play in the evolutionary processes of living organisms (**BIOS 260**).
4. **Breadth of Knowledge:** Biology is a broad discipline, and students are expected to acquire an extensive foundation across the sub-disciplines of biology. To this end, biological sciences majors are required to take at least one upper level course in each of the following areas: cell and molecular biology; organismal structure and function; biological diversity; and population biology (**specific BIOS 200-400-level electives, see course catalog**).
5. **Scholarship:** In order to expose our students to the latest developments in the discipline, we require in-depth exploration of specific fields, engaging students in current thinking, discoveries and methodologies of the discipline. To this end, all biological sciences majors will take two 'capstone' courses that build on the core curriculum and expose undergraduates to disciplinary scholarship at the graduate level (**BIOS 435, 495**).
6. **Research Methods:** Biology is both an empirical and theoretical science. We seek to engage students in the practice of biology through research and scholarly investigation. In this way, students are expected to develop experience with tools and methods of modern

research. To this end, biology majors will take a core laboratory course (**BIOS 435**) and at least one laboratory-based elective at the advanced level (**BIOS 300, 303, 305, 312, 313, 318, 324, 340**). They are encouraged to engage in independent study in a biological science research laboratory (**BIOS 499**).

7. **Communication:** As biology is a highly collaborative endeavor with significant impact on the world, we expect students to develop high-level writing and communication skills. To this end, biology students are expected to write essays and critical analyses for their course examinations at both the introductory and upper level. They will participate in open-ended project courses as well as research experiences (**throughout the curriculum**).

## **Summary of Biological Sciences Learning Outcomes**

Students completing the B.S. in Biological Sciences will be able to

- I. Quantitative Skills:

- a. collect and record data in a laboratory or field notebook
- b. summarize and communicate data using tables and graphs
- c. analyze data using statistical tests

**See statements: 2, 3, 4, 5, 6**

- II. Information Literacy:

- d. find relevant primary literature and other sources of reliable information
- e. analyze primary research articles: articulate the research question, the hypotheses (and the rationale behind these), the essential results, and the relationship of the results to the question/hypotheses

**See statements: 1-7**

- III. Communication:

- f. write scientific manuscripts and review papers
- g. present scientific information orally with the aid of appropriate visual aids

**See statements: 4, 6, 7**

- IV. Biology Content:

- h. rely upon their acquired knowledge of biology to effectively guide future learning, investigation, and deliberation in this discipline.

**See statements: 1-7**