



Biology | 2016-2017 Assessment Report

1. Please give a brief overview of the assessment data you collected this year.

We assessed Biology Learning Outcome 5 during this period.

Biology Program Learning Outcome 5: *Identify and interpret findings of scientists and communicate results of scientific work to others in the scientific community and the general public.*

Imbedded assessments were conducted in several biology courses. These included oral presentations and writing assignments (lab reports and papers). Biology students are provided with multiple opportunities to practice and improve (through faculty feedback) both written and oral communication skills. Assignments involving one or both of these skills are integrated throughout the Biology curriculum starting in introductory Biology courses and continuing through upper level courses. Data on grade averages from both written and oral communication assignments was assessed. Some examples are provided below. Overall, we determined that students are performing very well in these areas and that they are provided with ample opportunity to refine the important skills needed for effective science communication.

2. How will you use what you've learned from the data that was collected?

Based on our assessment, this learning objective is being addressed satisfactorily for Biology majors. We plan to continue offering a wide range of opportunities for our biology majors to refine their written and oral communication skills.

Examples:

Principles of Ecology - ENV SCI 302 (Dr. Amy Wolf)

Oral presentations: Yes; class average grade: AB

Scientific reports: Yes; class average grade: B

This is a core course for all Biology Majors that introduces general principles and applications of modern ecology and provides an opportunity for students to learn fundamental skills of scientific investigation. Lectures cover the ecological dimensions of evolution, physiology, population biology, community dynamics, ecosystem science, and conservation, as well as several topics in applied ecology. Labs provide experience in field methods, experimental design, data analysis, and scientific writing and oral presentations. Multiple lab reports are required. Students present the results of an ecological study during the last week of class.

Conservation Biology - ENV SCI 469 (Dr. Amy Wolf)

Oral presentations: Yes; class average grade: AB

Scientific reports: Yes; class average grade: B

This is an upper level writing emphasis course where assignments are designed to help develop scientific writing and general communication skills. Students write several reports throughout the semester. Each student is required to develop a semester long conservation project which is presented to the class at the end of the semester. YouTube videos and oral presentations are components of the semester long project.

Biology Capstone Seminar (Biology 490) (Dr. Robert Howe)

Oral presentations: Yes; class average grade: AB

All Biology majors are required to take this upper level course, Biology Capstone Seminar (Biology 490). One of the most substantial assignments in the course is a class presentation entitled "Frontiers in Biology." Each student must select a topic and peer-reviewed scientific article published during the past 3 years that has "important implications for science, society, or the earth's environment." During the assigned class period, the student will present background information (~ 10 minutes), then lead a discussion by posing important questions and prompting class members to express their views about the issues related to the "cutting edge" topic. This is not a team assignment – each student must organize and deliver the presentation and lead the discussion.

This assignment has evolved from previous versions in several ways. Most importantly, team presentations, which often resulted in one or two students doing most of the work, have been replaced by the individual projects. Students also are given more guidance about the selection of articles and the background information, which now includes a biographical sketch of the article's authors or research teams.

The Biology Capstone course is graded as pass/fail, so letter grades are not assigned for the course. However, the quality of student presentations in 2017 was better than ever before. Examples of the scientific topics included 1) treatment of cancers through targeted immunological responses to retroviruses and somatic mutations, 2) the synergistic effect of fungicides on honeybee populations, 3) an experimental study of plant divergence due to alternative pollinators, 4) groundwater depletion and international food trade, and 5) source-sink dynamics in penguin conservation. All students who completed the course delivered high quality presentations deserving a passing grade – in virtually all cases work that deserved a B or higher grade.

Field Botany BIOLOGY 320/520 (Dr. Jay Horn)

Oral presentations: Yes; class average grade: AB

Scientific reports: Yes; class average grade: B

Comments: Undergraduate students: each student chose a plant species native to Wisconsin and wrote an 8–10 page paper that i) summarized its diagnostic features and how the species

is distinguished from others in the same genus, ii) discussed factors (e.g., climate, soil) that influence the geographical and ecological distribution of the species in Wisconsin, and iii) reviewed **one** outstanding biological aspect of the species (e.g., pollination, or reproductive biology, or conservation biology). Literature citations were required. Based on this research, each student also gave a 10-minute oral presentation to the class on their species using original PowerPoint slides (and other relevant media).

Plant Physiology BIOLOGY 311 (Dr. Jay Horn)

Scientific reports: Yes; class average grade: BC

Comments: Students wrote three, three-page essays, each based on a peer-reviewed research paper that addressed a major question in plant physiology. These essays consisted of the student's own scientific critique of the article at hand. Students began each essay by briefly introducing the topic of the paper and describing the authors' motivation for conducting the study. They were then to describe the methods used by the authors, judging as best they could if they were adequate to address the hypotheses or issues motivating the study. Each essay concluded with an assessment of the legitimacy of the authors' conclusions, given the results that they obtained. I looked for the students to address these interests by making the best arguments they could in crisp, clear prose. I evaluated these essays not only for content and logic, but also for mechanics and style.