

Assessment of the organismal biology option of the BS in Biological Sciences

September 15, 2015

Introduction

Organismal Biology is one of several options for students majoring in Biological Sciences. This option was designed to provide students with a broad understanding of basic biological principles along with a strong foundation of chemistry, physics, and mathematics.

Methods

Faculty in the Ecology Department defined six learning outcomes (Table 1) among Organismal Biology majors. Students majoring in organismal biology were expected to be able to: communicate effectively, use physics and chemistry understand organisms, use scientific methods to answer scientific questions, evaluate scientific work, show how genetics and evolution affect organismal diversity, and demonstrate an understanding of hierarchy in biology (Table 1). For each of these outcomes, faculty in the Ecology Department identified appropriate ways for students to demonstrate that they had achieved these outcomes (Table 1). These indicators varied across indicators. In some cases, entire courses were used as indicators (e.g., completion of a course devoted to writing). In other cases, specific assignments were used to assess student outcomes (e.g., a research paper). Student achievement was assessed by identifying the most recent year-class of Organismal Biology students that had completed these indicators and noting whether student performance was greater than a threshold of C- (in either an entire course or an assignment within courses).

Results & Discussion

The sample size of students available to assess student achievement across outcomes varied, but in all cases, the data available showed all students were meeting the minimum threshold for achievement in Organismal Biology. Students in the Organismal Biology, therefore, appear to be reaching the outcomes desired for this program. There were no suggestions in the data collected or from discussions with faculty teaching courses taken by Organismal Biology students that the major needs to be modified in order to meet the outcomes that have been defined.

Table 1. Summary of outcomes, indicators, and results for the assessment of Organismal Biology students.

Outcome	Indicator	Rubric	Threshold	Result
1. Demonstrate effective written and oral communication	WRIT 101 COM 110 or CLS 101	Completion of course devoted to writing Completion of course devoted to speaking	>= C-	All students completing this major satisfied this requirement.
2. Demonstrate an understanding of physical and chemical factors that influence organisms, their physiology and ecosystem function.	CHMY 141, 143, 211 PHSX 205, 207 BCH 380 BIOE 370	Completion of general and organic chemistry Completion of biochemistry course. Completion of general physics Completion of general ecology	>= C-	All students completing this major satisfied this requirement.
5. Demonstrate an understanding of the process by which scientific knowledge is generated and evaluated	BIOB 170 lab	Completion of a science lab requiring students to design and conduct experiments and write lab reports.	>= C-	In Spring 2013, 20 Organismal Biology students completed the BIOB 170 lab. Every student had a lab grade greater or equal to C-.
6. Demonstrate the ability to use logic and reasoning evaluate one's own work and the work of others.	BIOE 499	Class presentation evaluating a peer-reviewed research paper	>= C-	In Spring 2013, 12 Organismal Biology students took this course. Their grades for class presentations were: 5 A's and 7 B's.
9. Demonstrate an understanding of the relationship between genetics and evolution and the influence of these disciplines on organismal diversity.	BIOE 499	Final paper	>= C-	In Spring 2013, 12 Organismal Biology students took this course. Their grades for their final papers were: 8 A's and 3 B's, and 1 C.
10. Demonstrate an understanding of the hierarchy of biology.	BIOE 499	Completion of course	>= C-	In Spring 2013, 12 Organismal Biology students took this course. Their final grades for the course were: 8 A's and 4 B's.