

2019
Elements of the Assessment Process
Form E-1-A for Boston College Biology Department

Biology CORE

- 1) **Have formal learning outcomes been developed? What are they?** (What specific sets of skills and knowledge does the department expect its majors to have acquired before they graduate?)

Students completing the Natural Science Core will:

1. expand their understanding of the principles, body of knowledge and investigative strategies that comprise science and its technological applications;
2. develop a scientific literacy that will promote curiosity, respect for the scientific method, and general awareness of the limitations of scientific conclusions;
3. recognize the role of scientific discovery, past, present and future, in interrelated topics such as human health, societal well-being and planetary sustainability; and
4. appreciate the role of science in defining their relationship with the natural world and their position within the cosmos.

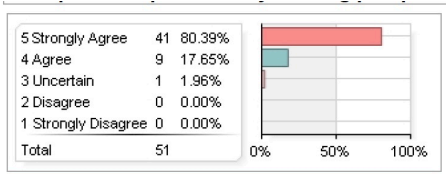
- 2) **Where are these learning outcomes published? Be specific.** (Where are the department’s learning expectations accessible to potential majors: on the web or in the catalog or in your department major handouts?) Arts and Science CORE Website

- 3) **Other than GPA, what data/evidence is used to determine whether graduates have achieved the stated outcomes for the degree?** (What do you use to assess which of the student learning outcomes are being achieved more or less well?)

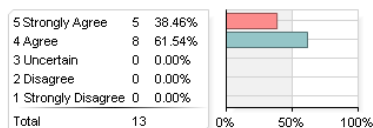
A. Student survey: The following questions were added to the course evaluations for each of the core courses. Agree (5) to Not Agree (1)

- 1. This course has shown me that even accepted ‘truths’ in science or medicine or society are open to exploration by shifting perspective and questioning.**

BIOL 1440

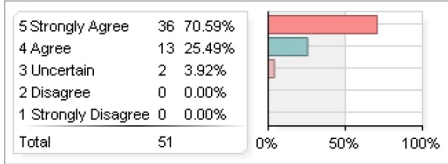


BIOL1702

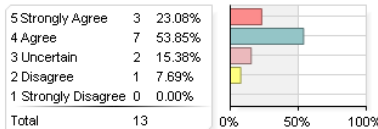


2. I have gained confidence that I can take complex questions or topics and apply analysis through a series of sub-questions.

BIOL1440

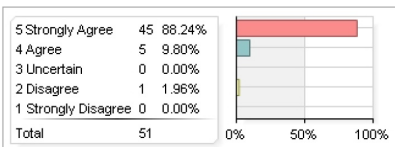


BIOL1702

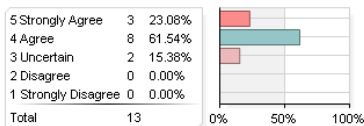


3. This course has challenged my curiosity and helped to develop my critical thinking skills.

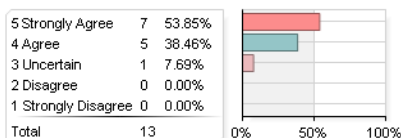
BIOL 1440



BIOL1702



4. (BIOL 1702 only) The final project helped to emphasize and solidify the biological concepts introduced through lecture.



Summary of student perceptions of their learning:

In Sustaining the Biosphere:

In Sustaining the Biosphere, students reported an increase in reflective, critical thinking about their choices and their interactions with Earth and with other beings, relative to last year's class.

In the Human Disease course, it is clear that the students felt the course experience was positive in all the areas around analysis and critical thinking: developing a healthy skepticism, ability to break big questions into smaller units and the importance of curiosity. The added question for this class about the utility of the final project confirms the instructors view that this is a worthwhile activity. Note- only 2/3 of the students responded – probably because the final course grades were posted on Canvas

B. Evaluation of student work. Faculty teaching in two non-major core courses (BIO1702 and 1440) will agree upon a particular core outcome with which to assess student work. The assessment strategy will be customized for each of the courses.

These two core courses were evaluated for student achievement in areas addressing each of the three survey questions.

**BIOL 1440 Sustaining the Biosphere
60 students**

Method of assessment: For the final course project, students created an art object that represented their identity as an ecological being, intimately connected with self, other and Earth. Along with this, they submitted a statement on their creation process, what it meant to them, what they learned, what was surprising about it, and what was difficult.

Each project was evaluated for its level of achievement in areas addressed in the survey and in Learning Goal 4 (appreciating the role of science in defining their relationship with the natural world and their position within the cosmos.): 5= high achievement; 1= low achievement

Did the project demonstrate an understanding of the student's interconnection with Earth?
Average score = 4.8

Did the project show evidence of detailed observation of the natural world?
Average score = 4.5

Did the project demonstrate the ability to be reflective (evidence of multiple levels of questioning observations and reactions)?
Average score = 4.7

Biol1440: Summary Student survey indicates that students think they have a good understanding of the importance of research to increasing our knowledge, that knowledge continues to expand and that curiosity is an important part of critical thinking. Student work indicates that students can use reflective questions to understand the natural world and their place in it, and can make detailed observations of the natural world.

**BIOL1702 Human Disease and Chronic Illness
19 students, all Freshman**

Method of assessment: For their final project, students researched and presented to the class a specific pathogen and its related human disease. Each project was evaluated for its level of achievement in areas addressed in the survey: 5= high achievement; 1= low achievement

Did the presentation use scientific data (experimental, ecological or epidemiological) to address the central question of the project.?
Average score: 3.8

Did the presentation break the central question into related sub-questions which could be analysed independently?
Average score: 3.8

Did the presentation offer sufficient points of analysis to further their critical thinking and to challenge the audience?
Average score: 2.6

Did the presentation offer up and connect back to the content of the course?
Average score: 3.3

BIOL 1702 Summary: Students have continued show marginal improvements in their ability to research a topic of interest, outline the rationale for a given approach and provide a narrative with directed analysis. While the performance evaluation indicates an overall average achievement, there were wide differences in the presentations. One presentation was clearly excellent. Two were very good. One was subpar. The remaining two were in the middle, each with strengths and weaknesses. As noted in 2018, it is a challenge to get student to engage in their project over the course of the semester, and thus developing critical thinking skills through questions and curiosity is compromised. This continues to be a challenge in 2019.

- 4) **Who interprets the evidence? What is the process?** (Who in the department is responsible for interpreting the data and making recommendations for curriculum or assignment changes if appropriate?)

Department Core Representative and faculty teaching in the core.

- 5) **What changes have been made as a result of using the data/evidence?** (Have there been any recent changes to your curriculum or program? Why were they made?)

BIOL 1702: This year the class followed much of what was in place last year – groups were assigned early, projects had to be in the form of a question to be explored and each group met with me individually. While I aggressively encouraged them to get engaged in the project early on and added regular project workshops in class, so I could easily answer questions, it was not enough to change the overall outcome. Student appreciation for the exercise was high, but getting them to realize the benefits early-on has been difficult.

BIOL1440: This year, the final course project and the written statement were directly assessed for evidence of detailed observation of the natural world, and the student's ability to ask probing, reflective questions.

- 6) **What evidence do you have that the changes have resulted in improved learning outcomes?**

BIOL 1702: As noted in 2018, procrastination prevents developing good critical thinking skills. While I tried to do more incremental assessment as students moved through their projects, I think this can be improved with a series of individual group meetings with me – to help and assess their progress. These meetings (perhaps three) need to begin early in the semester. Currently I do one of these meetings, but it is too late to have a major impact on the direction of the project.

BIOL1440: Last year, assessment focused on student narratives about their final class projects. This year, assessment of student work focused on assessment of the student project itself and alignment with their narrative, looking for evidence of attention to detail in the natural world and the ability to be deeply reflective. Students achieved each of these goals.

N/A

7) **Date of the most recent program review.** (Your latest comprehensive departmental self-study and external review.)

2007