

Environmental Biology

Cannon College of Arts and Sciences | Cannon College of Arts and Sciences

Degree(s): BA/BS

Level: Undergraduate

Minor: Yes

Licensure: No

CIP 26.1305

BIOLOGICAL AND BIOMEDICAL SCIENCES

└ Ecology, Evolution, Systematics, and Population Biology

└ Environmental Biology

Assessment Year 2021-2022

1 Graduating students will be able to explain the fundamental principles of environmental biology (habitat loss, climate change, interconnectedness, resource use, pollution, etc...)

Assessment The multiple choice portion of the environmental biology major senior exit exam focuses on this outcome on questions 1-25 (BIO 115). It is expected that 75% of environmental biology majors will pass at least 60% of the questions related to this outcome on the multiple choice portion of the exit exam, given multiple attempts. The senior exit survey obtains students opinions on their progress toward this outcome. 60% of students are expected to Agree or Strongly Agree with statements related to their understanding and practice of the concepts and/or skills associated with this outcome. On the Likert Scale of 1-5, it is expected students will rate statements at 3.1 average or higher. These artifacts are generated in ENV 497 which is taken during the semester prior to graduation.

Results**Target Achievement Rating*: 3**

Twelve students completed this portion of the exit exam with an overall score of 80%. Twelve (100%) students scored 60% or higher on this portion of the exam. The average Likert score on the senior exit survey for this outcome was 4.5, with 93% of the responses (28/30) as Agree or Strongly Agree. The targets for this outcome were met.

Action

The faculty were pleased that student learning exceeded the targets that were set for this outcome. However, because the class average in BIO 115 has been low in 2018 and 2019, they decided to reorganize the course to focus more on critical environmental concepts. This outcome will be assessed annually to ensure that students remain successful in meeting these targets. Also, because the exit exam is new, data for specific questions will be examined to strengthen the accuracy of this portion (e.g. modify questions where all students answers were correct or where all answers were incorrect).

2 Graduating students will be able to explain the fundamental principles of cell structure and function.

Assessment The multiple choice portion of the environmental biology major senior exit exam focuses on this outcome on questions 26-45 (BIO 150). It is expected that 75% of the environmental biology majors will pass at least 60% of the questions related to this outcome on the multiple choice portion of the exit exam, given multiple attempts. The senior exit survey obtains students opinions toward their progress on this outcome. 60% of students are expected to Agree or Strongly Agree with statements related to their understanding and practice of the concepts and/or skills associated with this outcome. On the Likert Scale of 1-5, it is expected students will rate statements at 3.1 average or higher. These artifacts are generated in ENV 497 which is taken during the semester prior to graduation.

Results**Target Achievement Rating*: 2**

Twelve students completed this portion of the exit exam with an overall score of 57%. Four (33) students scored 60% or higher on this portion of the exam. The average Likert score on the senior survey for the BIO 150 outcome was 3.7, with 65% of the responses (26/40) as Agree or Strongly Agree. The targets were partially met; not on the exam score, but yes on the senior survey.

Action

Because the cellular concepts are taught in the freshmen year and not reinforced in later courses, it may be impractical to expect 75% of the students to remember this material. We will encourage the students to review this area before taking the exit exam. Also, a number of the questions in this section of the new exit exam need attention and should be reassessed and improved (e.g. all correct and none correct). Faculty teaching the cell & molecular course have placed more emphasis on active learning activities, group case studies and other group work in and out of class, and have continued their efforts to improve laboratory writing skills through modifications to the lab report format.

3 Graduating students will be able to distinguish among taxonomic groups, based on form, function and evolutionary history, found in the plant and animal kingdoms (classification).

Environmental Biology

Assessment The multiple choice portion of the environmental biology major senior exit exam focuses on this outcome on questions 46-65 (BIO 200 - zoology) and 66-85 (BIO 205 - plant biology). It is expected that 75% of environmental biology majors will pass at least 60% of the questions related to this outcome on the multiple choice portion of the exit exam, given multiple attempts. The senior exit survey obtains students opinions on their progress on this outcome. 60% of students are expected to Agree or Strongly Agree with statements related to their understanding and practice of the concepts and/or skills associated with this outcome. On the Likert Scale of 1-5, it is expected students will rate statements at 3.1 average or higher. These artifacts are generated in ENV 497 which is taken during the semester prior to graduation.

Results

Target Achievement Rating*: 3

Twelve students completed the zoology (BIO 200) portion of the exit exam with an overall score of 79%. Twelve (100%) students scored 60% or higher on this portion of the exam. The average Likert score on the senior exit survey for the zoology outcome was 4.7, with 100% of the responses (30/30) as Agree or Strongly Agree. The overall score for eight students on the plant biology (BIO 205) portion of the exam was 70%. Eleven (92%) of the students scored 60% or higher on this portion. The mean Likert score for the plant biology portion was 4.0, with 70% of the responses (21/30) as Agree or Strongly Agree. All targets were met.

Action

The faculty were pleased with the outcomes. Upon completion, data were collected, test questions were scrutinized, and improvements were made for the next testing cycle for 2022-2023. This was especially true due to the changes in faculty since the previous academic year. Several curricular and pedagogical changes were made to the core courses in order to improve student learning outcomes for future cohorts.

4 Graduating students will be able to explain the physiology, genetics, and the medical and ecological importance of microorganisms.

Assessment The multiple choice portion of the environmental biology major senior exit exam focuses on this outcome on questions 86-105 (BIO 320 - Microbiology). It is expected that 75% of environmental biology majors will pass at least 60% of the questions related to this outcome on the multiple choice portion of the exit exam, given multiple attempts. The senior exit survey obtains students opinions on their progress toward this outcome. 60% of students are expected to Agree or Strongly Agree with statements related to their understanding and practice of the concepts and/or skills associated with this outcome. On the Likert Scale of 1-5, it is expected students will rate statements at 3.1 average or higher. These artifacts are generated in ENV 497 which is taken during the semester prior to graduation.

Results

Target Achievement Rating*: 1

Twelve students completed this portion of the exit exam with an overall score of 58%. Six (50%) students scored 60% or higher on this portion of the exam. The average Likert score on the senior exit survey for this outcome was 3.7, with 58% of the responses (29/50) as Agree or Strongly Agree. One of the survey targets were met, but the two exam targets were not met.

Action

While the feedback from the senior survey demonstrated general satisfaction with the course, and met the targets, the exam portion fell short of our expectations. The data from the questions in this section were analyzed and several will be changed to improve the exam (too easy or too difficult - does not discriminate). Those questions will be replaced and this outcome will be reassessed again next year.

5 Graduating students will be able to explain the concepts and theories behind the structure of communities and ecosystems, as well as population, evolutionary and applied ecology.

Assessment The multiple choice portion of the environmental biology majors senior exit exam focuses on this outcome on questions 106-125 (BIO 421, animal ecology) and 126-145 (BIO 422, plant ecology). It is expected that 75% of environmental biology majors will pass at least 60% of the questions related to this outcome on the multiple choice portion of the exit exam, given multiple attempts. The senior exit survey obtains students opinions on their progress toward this outcome. 60% of students are expected to Agree or Strongly Agree with statements related to their understanding and practice of the concepts and/or skills associated with this outcome. On the Likert Scale of 1-5, it is expected students will rate statements at 3.1 average or higher. These artifacts are generated in ENV 497 which is taken during the semester prior to graduation.

Results

Target Achievement Rating*: 3

Twelve students completed the animal ecology (BIO 421) and plant ecology (BIO 422) portion of the exit exam with an overall score of 70%. Twelve (100%) students scored 60% or higher on this portion of the exam. The average Likert score on the senior exit survey for the animal ecology and plant ecology outcome was 4.2, with 84% of the responses (16/19) as Agree or Strongly Agree. All targets were met.

Action

The department was satisfied with the outcomes for this portion of the exam. Faculty changed questions from previous exit exams to better



Environmental Biology

word questions. This seemed to have had a positive effect on student outcomes.