2021-2022 Assessment Cycle

Assessment Plan

Mission Statement

Biology is an integrative discipline that emerges from all areas of the natural sciences and builds upon those foundations. In the spirit of our discipline the Biology Department is committed to providing students with a strong foundation in the life sciences that culminates in specialized experiences designed to prepare students not only for diverse career opportunities available in the biological sciences, but also to be life-long learners. Fundamental to our students' development is the acquisition of a broad knowledge base, the ability to integrate and apply this knowledge, and the ability to communicate observations and analyses. Through close interaction with our faculty in the classroom and in research environments the Biology Department fosters students' innate desire for discovery and helps them develop the skills and modes of thinking that will empower their contributions to an ever-expanding understanding of the natural world.

Both the BA and BS degrees in Environmental Biology are designed to meet the needs of students expressing an interest in environmental biology and preparing them to be competitive as applicants to graduate programs. This degree is built around a biology core emphasizing the principles of ecology and evolution with an orientation towards natural resources, conservation, and other environmental concerns.

Measures

BA - Environmental Biology Outcome Set

PSLO 1

Outcome: Describe or distinguish major biological principles

Describe or distinguish major biological principles in cell biology, genetics, organismal biology, ecology, and evolution.

▼ **Measure:** Course Grades

Course level Direct - Student Artifact

Details/Description:	Performance in core courses
Acceptable Target:	60% earn a B or better for BI 102; 70% earn a B or better average for all other core courses

Measure: Major Field Test
Program level Direct - Exam

Details/Description:	The Major Field Test in Biology is a national exam used to assess mastery of concepts, principles and knowledge by graduating Biology students. The use of this test allows us to compare the performance of our students relative to those at approximately 1,500 accredited four year institutions. The test is organized into four major areas: cell biology; molecular biology and genetics; organismal biology; and population biology, evolution and ecology.
Acceptable Target:	Mean student score above the national standard in all sub-areas of the exam.

Measure: Student Exit Survey
Program level Indirect - Survey

Details/Description:	Student response in exit survey administered by the Biology Department.
Acceptable Target:	90% of students agree with senior exit survey questions pertaining to PSLO 1.

PSLO 2

Outcome: Demonstrate complex interrelationships

Demonstrate the complex interrelationships amongst ecological and evolutionary forces and how they influence organisms, populations, and community function.

Measure: Course Embedded Assignment

Course level Direct - Student Artifact

Details/Description:	Performance in relevant sections of courses.
Acceptable Target:	85% Earn a B or better average in quizzes and exams in the ecology labs in the BI 103 course and all labs in BI 310

Measure: Course Grades

Course level Direct - Student Artifact

Details/Description:	Course grades in relevant courses.
Acceptable Target:	70% earn a B or better for BI 103; 70% earn a B or better average in BI 310 and BI 340

Measure: Major Field Test

Program level Direct - Exam

Details/Description:	The Major Field Test in Biology is a national exam used to assess mastery of concepts, principles and knowledge by graduating Biology students. The use of this test allows us to compare the performance of our students relative to those at approximately 1,500 accredited four year institutions. The test is organized into four major areas: cell biology; molecular biology and genetics; organismal biology; and population biology, evolution and ecology.
Acceptable Target:	Mean student score above the national standard in the “population genetics, evolution, and “ecology”

subsection of the exam.

PSLO 3

Outcome: Explain the scientific process
Explain the scientific process and be able to discriminate between different approaches to science.

Measure: Course Embedded Assignment
Course level Direct - Student Artifact

Details/Description:	Performance in relevant sections of courses.
Acceptable Target:	85% Earn a B or better in 1 lab in the BI 103 course and 3 labs in BI 310 that specifically address the scientific process; 70% achieve an 85% or better in BI 103 exams regarding relevant section and BI 310 embedded questions in the final exam.

Measure: Course Grades
Program level Direct - Student Artifact

Details/Description:	Course grades in relevant courses.
Acceptable Target:	75% earn a B or better in BI 395; 70% earn a B or better average for all other core courses.

Measure: Exit Survey
Program level Indirect - Survey

Details/Description:	Student response in exit survey administered by the Biology Department.
Acceptable Target:	90% of students agree with senior exit survey

questions pertaining to PSLO 3.

PSLO 4

Outcome: Basic biology of major taxonomic group
Identify, recognize, and recall the basic biology of at least one major taxonomic group.

Measure: Course Embedded Assignments
Course level Direct - Student Artifact

Details/Description:	Performance in relevant sections of courses.
Acceptable Target:	85% Earn a B or better average in quizzes and exams related to organism identification and anatomy labs in the BI 103 course and 75% earn a B or better in lab components of BI 302, BI 303, BI 305, BI 322, BI 315, or BI 324.

Measure: Course Grades
Program level Direct - Student Artifact

Details/Description:	Course grades in relevant courses.
Acceptable Target:	70% earn a B or better average in BI 103 and BI 301, BI 302, BI 303, BI 305, BI 322, BI 315, or BI 324

Measure: Major Field Test
Program level Direct - Exam

Details/Description:	The Major Field Test in Biology is a national exam used to assess mastery of concepts, principles and knowledge by graduating Biology students. The use

	of this test allows us to compare the performance of our students relative to those at approximately 1,500 accredited four year institutions. The test is organized into four major areas: cell biology; molecular biology and genetics; organismal biology; and population biology, evolution and ecology.
Acceptable Target:	Above the national standard in the "organismal biology" subsection of the exam.

PSLO 5

Outcome: Design experiments and interpret data
Design experiments and analyze and interpret basic scientific data.

Measure: Course Embedded Assignments
Course level Direct - Student Artifact

Details/Description:	Performance in relevant sections of courses.
Acceptable Target:	90% Earn a B or better average in 2 labs in BI 103 and 4 labs in BI 310 that address experimental design and/or data analysis.

Measure: Course Grades
Program level Direct - Student Artifact

Details/Description:	Course grades in relevant courses.
Acceptable Target:	85% earn a B or better average in BI 395; For BS 70% also earn a B or better in BI 314, MA 140, or MA 145.

Measure: Exit Survey

Program level Indirect - Survey

Details/Description:	Student response in exit survey administered by the Biology Department.
Acceptable Target:	90% of students agree with senior exit survey questions pertaining to PSLO 5.

Measure: Oral and Written Presentations

Program level Direct - Student Artifact

Details/Description:	Assessment of oral presentations or written assignments has been conducted in the BI 390 course. Starting in the Fall of 2021 we will also be implementing written assignments that will follow the same rubric in the following core courses BI 103, 310, and 340.
Acceptable Target:	Critical Thinking Rubric - 90% of environmental biology majors are at target (3) level for all rubric components in seminar course. *Starting in Fall 2021 70% of students achieve target level in final papers for "Explaining Scientific Concepts", "Interpreting Scientific Data", and "Presenting conclusions and future experimental directions" sections of "Written Communication-Rubric"

Supporting Attachments:

- scientific critical thinking rubric.pdf (Adobe Acrobat Document)
- written communications rubric (Adobe Acrobat Document)

Measure: Original Research Outcome

Course level Direct - Student Artifact

Details/Description:	All Environmental Biology students are required to conduct BI 395 research at the end of which all students have to present their work or write a report. Assessment of presentations or written report will be conducted following the attached rubric.
Acceptable Target:	Critical Thinking Rubric - 90% of environmental biology majors are at target (3) level for all rubric components.

Supporting Attachments:

scientific critical thinking rubric.pdf (Adobe Acrobat Document)

PSLO 6

Outcome: Oral and written presentation
Explain scientific information in oral and written presentation in a clear and professional manner.

Measure: Course Embedded Assignments
Program level Direct - Student Artifact

Details/Description:	Students have conducted oral presentations in BI 103, BI 310, and BI 340 through the spring of 2021. These are assessed using the "Oral Communication Rubric" designed for our capstone course BI 390. Starting in the Fall of 2021, the BI 103 and BI 310 courses have begun using final papers and will be assessed using the "Written Communication-Rubric".
Acceptable Target:	90% of environmental biology majors earn a C or better in presentations or final papers in BI 103, BI 310, and BI 340. Oral Communication Rubric - 90% of environmental biology majors are at target (3) level

for all rubric components in seminar courses. *Starting in Fall 2021 70% of students achieve target level in final papers for "Explaining Scientific Concepts" and "Interpreting Scientific Data" sections of "Written Communication-Rubric".

Supporting Attachments:

- oral communication rubric.pdf (Adobe Acrobat Document)
- written communications rubric (Adobe Acrobat Document)

Measure: Course Grades
Program level Direct - Student Artifact

Details/Description:	Course grades in relevant courses.
Acceptable Target:	85% earn a B or better average in BI 390.

Measure: Exit Survey
Program level Indirect - Survey

Details/Description:	Student response in exit survey administered by the Biology Department.
Acceptable Target:	90% of students agree with senior exit survey questions pertaining to PSLO 6.

Measure: Oral and/or Poster Presentation
Program level Direct - Student Artifact

Details/Description:	Students conducting BI 395 in Environmental Biology are often able to present at regional or national conferences.
Acceptable Target:	70% of students present at least once at a

conference.

Analysis and Reporting Calendar

Data are collected for each PSLO (1-6) every 4 years.

Stakeholder Involvement

Faculty: Summaries of each year's analyses are presented at the first department faculty meeting following the annual report. Results are also directly discussed with individual faculty members who: 1) were most recently involved in teaching relevant courses and 2) faculty who will be leading upcoming sections of relevant courses.

Students: Although not expressed explicitly as PSLO's the desired outcomes are directly expressed to students in the syllabi of relevant courses and students have assessment tools (e.g., rubrics, assignments, exams, etc.) and grades available.

External stakeholders: Currently Program Assessment Plans and Reports are made available to external stakeholders on our departmental website.

Program Assessment Plan Review Cycle

The Program Assessment Plan is reviewed every 4 years.

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