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 goal of the B.S. in Biology (Secondary Ed Emphasis) and B.Ed. Biology degree programs is to prepare students to bring multiple scientific approaches and analytical skills to the classrooms that they will be leading. 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.

Measures

BS in Secondary Biology Education Outcome Set

BS Biology (Ed Emph)

Outcome: PSLO 1

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:	BI 102 (General Cellular Biology) and BI 103 serve as the introductory sequence for all biology majors and thus set the stage for all other courses. BI 102 covers the major principles of the chemical,

	genetic, and microscopic properties and processes of cells. BI 103 introduces major topics of ecology, evolution, biodiversity, anatomy, and physiology. The upper division core classes BI 301 (General Microbiology), BI 310 (General Ecology), BI 333 (General Genetics), and BI 340 (Evolutionary Biology) cover the main biological disciplines in more depth and develop the students' critical thinking, scientific reasoning, and quantitative skills.
Acceptable Target:	75% of students in the BS Biology (Secondary Ed Emphasis) and BEd Biology programs earn an overall grade of B or higher in BI 102 and BI 103. 90% earn a grade of B or higher in the upper division core courses.

Measure: Major Field Test
Program level Direct - Exam

Details/Description:	The ETS Major Field Test for Biology is a comprehensive outcomes assessment. The questions are presented in a way to evaluate students' understanding of biological processes as well as their analytical and problem solving abilities. The four sub scores represent the major disciplines within the biological sciences: 1) Cellular Biology 2) Molecular Biology & Genetics 3) Organismal Biology 4) Population Biology, Ecology, & Evolution. The Major Field Test is administered using an online format. This provides immediate feedback to all students by listing their overall score and sub scores as well as those of the department and national averages. It also lists the percentile rank for the individual student and the average rank of Washburn graduates for the score and sub scores.
Acceptable Target:	≥50% of students in the program have an overall

score in the 75th percentile or higher. All students score above the national average in at least two of the four sub scores of the exam.

Supporting Attachments:

Major Field Test - Biology (Web Link)
https://www.ets.org/mft/about/content/biology

Measure: Senior Exit Survey
Program level Indirect - Survey

Details/Description: Exit surveys are completed by every student graduating from the department. Three questions align most closely with PSLO 1.
1) How would you rate the overall quality of instruction in the Department of Biology?
9) How effective was the Biology course at helping you develop your analytical skills?
10) How effective was the Department of Biology at providing you with a broad understanding of biological principles?

Students can score each question as Excellent (1), Very Good (2), Satisfactory (3), Unsatisfactory (4), or Poor (5). The average score of the three questions listed above is determine for each student in the programs.

Acceptable Target: 100% of students have an average score of satisfactory or higher for the senior exit survey questions pertaining to PSLO 1.

Supporting Attachments:

Senior Exit Survey (Word Document (Open XML))

Outcome: PSLO 2
Demonstrate the complex interrelationships amongst ecological and evolutionary forces and how they influence organisms, populations, and community function.

Measure: Course Embedded Assignments (Ecol/Evol)
Course level Direct - Student Artifact

Details/Description:	BI 103 introduces students to the major principles of organismal biology (ecology, evolution, diversity, anatomy and physiology). Four labs in BI 103 introduce student to the process of collecting, analyzing, and interpreting ecological and/or evolutionary data. Assignments and quizzes are used to evaluate the students understanding of this a material. The average score on these assignments and quizzes is used a formative assessment for this PSLO. BI 310 provides a deeper investigation into ecological processes and how those processes lead to changes in populations and communities. BI 340 explores the mechanisms of biological evolution and how they can lead to short- and long-term changes in populations and biodiversity. These courses include assignments and lab activities in which students perform more in-depth investigations of ecological and evolutionary processes. The average of these assignments provide additional formative assessments that measures the development of students' analytical skills and how they are being applied to ecological and evolutionary data.
Acceptable Target:	90% earn an average grade of C or higher for 4 labs and associated quizzes in BI 103. 90% earn an average grade of B or higher for the lab assignments in BI 310. 90% earn an average of B or higher for the assignments in BI 340.

Measure: Major Field Test (Ecol & Evol)
Program level Direct - Exam

Details/Description:	The ETS Major Field Test for Biology is a comprehensive outcomes assessment. The questions are presented in a way to evaluate students' understanding of biological processes as well as their analytical and problem solving abilities. The four sub scores represent the major disciplines within the biological sciences: 1) Cellular Biology 2) Molecular Biology & Genetics 3) Organismal Biology 4) Population Biology, Ecology, & Evolution.
Acceptable Target:	≥50% of students in the program score at or above the Above the national average in the "Population Biology, Ecology & Evolution " subsection of the exam

Analysis and Reporting Calendar

Data are collected each year for all SLO's. The number of majors in this program is relatively low compared to other majors in the department. In order to have a more meaningful analysis, two SLO's are assessed every three years to ensure that there are enough students to provide reliable statistics. The proposed reporting schedule is as follows:
2020 - 2021: SLO's 5 &6
2021 - 2022; SLO's 1 & 2
2022 - 2023: SLO's 3 & 4

Stakeholder Involvement

Graded lab exercises, reports, quizzes, and exams (along with comments) are regularly returned to students

throughout the semester in each of the core courses. All students who are pursuing BS Biology (Secondary Ed Specialization) and BEd Biology degrees are tasked with developing a science methods portfolio. A component of this portfolio requires that the student reflect upon their own learning. Part of this reflection involves meeting with professors outside of class to discuss the assessment process and ways to improve their own learning and assessment strategies. We continue to discuss particularly relevant portions of the program assessment during their regular advising appointments.

Department reports are made available to external stakeholders upon request. In an effort to increase transparency but minimize paper waste, our ongoing goal has been to make reports available through a link on the department website. Construction of the website has been a slow process and it has proven difficult to keep it updated with the relevant information. This concern will be placed near the top of the agenda for the first faculty departmental faculty meeting. The completion of this task will make it easier for all interested parties to gain access to information contained in the reports.

Program Assessment Plan Review Cycle

A major review of the Program Assessment Plan will be conducted every five years. The last review was in 2019-2020 for the B.S. Biology (Sec Ed) and coincided with the introduction of the B.Ed. Biology program. No changes have been made since the combined assessment plan for the programs has been implemented.

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