Departmental Assessment Plan: Student Learning Outcomes

(Please submit, electronically, to division office.)

Program Information	
Academic Program (Major)	Biology
Degree	Biology
Department	Biology
Division	NSM
Academic Year	2011-12
Departmental Contact Person Biology is highly engaged in assessment and recognizes three faculty for coordination efforts.	
Name	Dr. Erin Baumgartner (non-majors/LACC Assessment) Dr. Sarah Boomer (majors/200 Series Assessment) Dr. Bryan Dutton (majors/ETS-Exit Survey Assessment)
Title	Baumgartner: Associate Professor of Biology Boomer: Professor and Head (2011-12) of Biology Dutton: Professor and Head (2012-3) of Biology
Department	Biology
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Program Mission Statement and Learning Outcomes

Mission

The biology department prepares students for careers in biology and science education, and admission to graduate and professional schools in the life and health sciences. We also promote the understanding of biology as an essential part of a liberal arts education and of global citizenship.

Learning Outcomes

1. Understand key concepts from the many disciplines within the biological sciences.
2. Engage in laboratory experimentation, data analysis and interpretation, and critical thinking at all course levels.
3. Have opportunities to augment their coursework experiences with advanced studies and research within areas of particular interest.

Program Learning Outcome Assessment

The Department of Biology is engaged in 3 primary levels of assessment related to each outcome and its related mission objectives: (a) 100 Series; (b) 200 Series; (c) ETS/Exit. EACH of these levels will be described for each outcome below.

Learning Outcomes published in the most recent academic catalog.	Outcome 1	Understand key concepts from the many disciplines within the biological sciences
	Outcome 2	
	Outcome 3	

Target	*Describe what level of proficiency or percent student attainment of the stated learning outcome.* a. BI 101-2-3 targets a level of proficiency for all students in which they can recognize and define basic concepts. All survey and indicator questions represent this level of knowledge, as do 70% of the exam questions. We assume students performing to this level can earn a C in a BI 100 series course. An additional 20% of exam questions require students to put together at least two concepts and apply information in a way that has been demonstrated in class to perform at B-level. A final 10% of questions require students to put together multiple concepts presented during the course of the term and apply knowledge in new ways to perform at the A-level. a. BI 211-2 targets a level of proficiency for all students in which they can recognize and define basic concepts. We assume students performing to this level can earn a C in a BI 211-2 course. c. Although graduating Biology majors have taken the ETS exam since 1996 (it is now a stated graduation requirement that 100% graduates take), we have not defined a target for proficiency on this exam because background data (i.e. other institutional data) and relative percentiles have changed over the years.
Data Source	*Describe where and when data will be collected, how and if students will be sampled, and estimated sample size.* a. Dr. Baumgartner coordinates all concept assessment in our 100-level non-majors series/LACC coursework (BI 101-2-3) year-round. She and the 100 instructional team are also engaged in collecting demographic and attitudinal information. All students

	participating in BI 100-series courses are invited to complete anonymous pre- post- course surveys. Survey return rate is approximately 50-70% per course. Survey items include demographic indicators, Likert-scale attitude statement response questions, and multiple choice content questions. Students also complete indicator questions aligned to learning outcomes on course exams, and all BI 100 series instructors develop exams using a common template that aligns question difficulty to our grading scale. b. Several instructors (Boomer, Latham, Baltzley, Dutton, and Haberman) in our majors/200 series (BI 211-2) are engaged in concept assessment, which employ multiple choice content questions given via a pre-test followed by embedded mid-term and/or final questions. Given its key position and role in retention, the BI 211 team (Boomer, Latham, Baltzley) is also engaged in collecting demographic and Likert-scale attitude statement response information. For BI 211, the starting sample size was approximately 200; for BI 212, the sample size was approximately 70. c. Dr. Dutton coordinates majors/ETS-Exit Survey assessment, which is given at the end of spring term to all graduating majors. The sample size this year was 32. NOTE: Several other instructors (see Department Report) are also engaged in content assessment in other majors coursework, primarily utilizing multiple choice content questions given via a pre-test followed by embedded mid-term and/or final questions.
Means of Assessment	*Describe in detail the method of assessment you will be using (e.g., capstone project, course-embedded assessment, standardized instrument, etc.).* a. Concept mastery in BI 101-2-3 is assessed via multiple choice indicator questions that have discrete answers. Individual instructors administer and grade questions and report results to Dr. Baumgartner. Content mastery is also assessed via pre- post-survey questions. Students complete anonymous surveys via the online program Survey Monkey, which are then collected and tabulated by Dr. Baumgartner, who conducts statistical analysis comparing pre- and post- concept scores. b. Concept mastery in BI211-2-3 is based on administering a pre-course exam, and comparing data to embedded post-exam questions. All multiple choice indicator questions have discrete answers. Individual instructors administer and grade questions.

	c. The Department of Biology supports and administers the national ETS Field Test in Biology, including paying (approximately $1000 this year, for 32 students) for this access. Additionally, we have developed an in-house Exit Survey designed to collect demographic, attitudinal information related to career/training placement, basic skills, research, and advising satisfaction.
Means of Scoring	*Describe how you will score the assessment. For example, will you use a rubric or answer key, or will it be scored by a testing company? (If you plan to use a rubric, be sure to include the rubric as an appendix.) Who will do the scoring? One or more people? How will scores be reported (e.g., total scales or subscores)?* a. All survey data is electronically archived, in accordance with IRB-approved protocols by Dr. Baumgartner. Student performance on exam indicator questions is aggregated and stored electronically by Dr. Baumgartner. b. Concept mastery in BI211-2-3 utilizes multiple-choice style questions that have discrete answers. Course instructors administer and grade all questions, and maintain assessment scoring records. Because BI 211 assessment is utilized in faculty research, all data is archived in accordance with IRB-approved protocols (PI's = Drs. Boomer, Latham, and Baltzley) c. The ETS Field Test in Biology is administered by available Biology faculty (the 2.5 hour exam was given 3 times this spring), sealed, and mailed to ETS for grading. Dr. Dutton receives scores in the summer and maintains assessment records.

Evidence Storage	*Describe how/where the evidence pertaining to the assessment process is being archived. Electronic archive is preferred when possible. Please be certain that records can be retrieved for review by internal (e.g., division, college, university) or external (e.g., NWCCU) reviewers.* In general, the Biology Department will save analyzed assessment data to an accessible network drive (e.g., "I"). These data will be backed-up on a nightly basis through an automatic process overseen by WOU's University Computing Services (UCS). In addition, every month, the UCS archives the contents of the entire file system as extra data protection. The latest backup tapes are housed in a secure off-campus location in case of a major disaster such as a fire or earthquake. These redundant backup measures will assure the safety of assessment data. Analyzed data will be available for both internal and external reviewers upon request. As stated, key assessment projects are also integral to faculty research, and additional IRB-approved data storage methods are utilized for raw data

	containing sensitive student information. For example: a. All BI 101-2-3 survey data is electronically archived, in accordance with IRB-approved protocols by Dr. Baumgartner. Student performance on exam indicator questions is aggregated and stored electronically by Dr. Baumgartner. b. All BI 211 survey data is archived (hard-copy and electronically, in accordance with IRB-approved protocols by Drs. Boomer, Latham, and Baltzley.

Program Learning Outcome Assessment	
Learning Outcomes published in the most recent academic catalog.	Outcome 1:
	Outcome 2: Engage in laboratory experimentation, data analysis and interpretation, and critical thinking at all course levels.
	Outcome 3:
Target	*Describe what level of proficiency or percent student attainment of the stated learning outcome.* Given that we just collected our first official round of preliminary data, we have yet to formally define a target level of proficiency for each component of this outcome.
Data Source	*Describe where and when data will be collected, how and if students will be sampled, and estimated sample size.* Preliminary first-time data was just collected via our aforementioned Exit Survey process (point c in the content section). As stated, this survey is given to all graduating seniors (sample size = 32 this year).
Means of Assessment	*Describe in detail the method of assessment you will be using (e.g., capstone project, course-embedded assessment, standardized instrument, etc.).* For this preliminary first-time analysis, the department designed 2 sets of assessment questions related to this learning outcome: (1) students self-rate their abilities in terms of key skills related to this outcome (e.g. experimental design, technology/equipment,

	data analysis, graphing, writing/critical analysis); and (2) students rank/list top key courses/labs from our inventory of majors-level courses (both core and advanced elective) that most positively contributed to key skills. This analysis will serve as a stepping stone towards defining more specific course projects and assessment tools in future years.
Means of Scoring	*Describe how you will score the assessment. For example, will you use a rubric or answer key, or will it be scored by a testing company? (If you plan to use a rubric, be sure to include the rubric as an appendix.) Who will do the scoring? One or more people? How will scores be reported (e.g., total scales or subscores)?* Collected data at this point represents student self-ratings and a coursework/lab inventory; no discrete grading is required.

Evidence Storage	*Describe how/where the evidence pertaining to the assessment process is being archived. Electronic archive is preferred when possible. Please be certain that records can be retrieved for review by internal (e.g., division, college, university) or external (e.g., NWCCU) reviewers.* Please see previous Evidence Storage section.

Program Learning Outcome Assessment

Learning Outcomes published in the most recent academic catalog.	Outcome 1	
	Outcome 2	
	Outcome 3	Have opportunities to augment their coursework experiences with advanced studies and research within areas of particular interest.
Target	*Describe what level of proficiency or percent student attainment of the stated learning outcome.* Given that we just collected our first official round of preliminary data, we have yet to formally define a target level of proficiency for each component of this outcome. As further noted by several faculty, providing undergraduates independent study-style research opportunities remains a challenge, given lack of support; despite a high level of such research engagement this last year,	

	concerns exist about the sustainability of such a level and thus we need to analyze these data longer term.
Data Source	*Describe where and when data will be collected, how and if students will be sampled, and estimated sample size.* Presently, research engagement data is being collected via: (1) For students who are engaged in research via formal independent study credit, formal "course by arrangement" (which contain research contract information) forms are maintained. (2) Because a number of students avoid paying for formal research credit (for financial reasons), we additionally survey graduating seniors using the aforementioned Exit Survey. This survey samples all graduating biology majors (32 this year). (3) We also track research engagement via records of PURE/Academic Showcase participation (i.e. the number of student presentations – poster or talks – per year). (4) Faculty annual reports (assembled into Department annual reports) are also required to contain citations regarding research mentorship (credited or unofficial) and research presentations (PURE/Academic Showcase or beyond).
Means of Assessment	*Describe in detail the method of assessment you will be using (e.g., capstone project, course-embedded assessment, standardized instrument, etc.).* Our methods enumerate the number of students engaged in research projects with faculty – based on counting/reporting independent study credits, unofficial research (self- or faculty-reported), and authorship on presentations (on campus via PURE/Academic Showcase, or beyond).
Means of Scoring	*Describe how you will score the assessment. For example, will you use a rubric or answer key, or will it be scored by a testing company? (If you plan to use a rubric, be sure to include the rubric as an appendix.) Who will do the scoring? One or more people? How will scores be reported (e.g., total scales or subscores)?* Our approach uses no rubric. Please see previous sections.

Evidence Storage	*Describe how/where the evidence pertaining to the assessment process is being archived. Electronic archive is preferred when possible. Please be certain that records can be retrieved for review by internal (e.g., division, college, university) or external (e.g., NWCCU) reviewers.* Please see previous Evidence Storage sections.