

GCU Academic Program Assessment Plan (Updated Fall 2016)

Program: Biology (BA and BS)

Learning Outcomes: Upon successful completion of the program of studies for the BA / BS in Biology, the student will earn a Bachelor of Arts / Sciences degree and will have given evidence of the following program outcomes:

GOAL 1. Knowledge and Theories of Biology

LO1: The student will understand and apply key concepts and theories in the areas of Biology (molecular / cell biology and / or environmental and organismal biology) as evidenced through in class testing and course assignments.

GOAL 2. Laboratory / Field Skills

LO2: Students will develop appropriate laboratory and/or field skills for the biology professional including proper formulation of testable hypotheses, effective use of sampling tools and instrumentation, precise and accurate data collection, and effective analysis and interpretation of results as evidenced from lab reports and the results of practical lab exams.

Goal 3: Ability to Read Effectively and Critically Evaluate Scientific Literature

LO3: Students will demonstrate the ability to effectively read and critically evaluate scientific literature as evidenced by rubric driven analysis of signature assignments in BI201 (Biological Literature) and BI444 (Senior Seminar).

Goal 4: Ability to Communicate Biological Information Effectively.

LO4: Students will learn to communicate biological information effectively as evidenced by rubric driven analysis of oral presentations in BI120 (Biological Diversity), BI121 (Biological Unity) and BI444 (Senior Seminar), and of rubric driven analysis of formal laboratory reports prepared in BI204 (Biological Unity) and upper level biology elective courses.

Goal 5: Integration of Personal and Ethical Values into Study of Biology

LO5: Students will demonstrate an appreciation for the ethical and social dimensions of science, including appreciation of the importance of ethical conduct in science as evidenced by students' responses on the departmentally generated values survey. Students will develop knowledge of contemporary social and ethical issues related to biology and the professional responsibilities of a biologist. Students will demonstrate a strong appreciation for the diversity of living organisms and the potential impacts of human actions on the environment.

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<i>Related ISLG (Undergraduate)</i>	ISLG 3	ISLG 2	ISLG 2	ISLG 1	ISLG4
<i>Related BRIDGE General Education Goals (if applicable)</i>	Bridge Goal 2 (BI121)	Bridge Goal 1 (BI121)	Bridge Goal 2 (BI121)	Bridge Goal 2 (BI121)	Bridge Goal 3 (BI121)
<i>Related Accreditation Standard (if applicable)</i>	N/A	N/A	N/A	N/A	N/A
Program Courses and Experiential Learning Mapping to Program Outcomes					
How do students learn this? In what course(s) and/or co-curricular experience(s)?	BI109, BI111, BI120, BI121, BI201, BI203, BI204, BI213, BI214, BI219, BI275, BI305, BI320, BI324, BI325, BI327, BI331, BI340, BI360, BI407, BI422, BI425, BI437, BI438, BI439, BI443, BI444, BI490	Laboratory Experiences within BI109, BI111, BI120, BI121, BI201, BI203, BI204, BI213, BI214, BI219, BI275, BI305, BI320, BI324, BI325, BI327, BI331, BI340, BI360, BI407, BI422, BI425, BI437, BI438, BI439, BI443, BI444, BI490	BI109, BI111, BI120, BI121, BI201, BI203, BI204, BI213, BI214, BI219, BI275, BI305, BI320, BI324, BI325, BI327, BI331, BI340, BI360, BI407, BI422, BI425, BI437, BI438, BI439, BI443, BI444, BI490with focus on BI201, BI443 and BI444	BI109, BI111, BI120, BI121, BI201, BI203, BI204, BI213, BI214, BI219, BI275, BI305, BI320, BI324, BI325, BI327, BI331, BI340, BI360, BI407, BI422, BI425, BI437, BI438, BI439, BI443, BI444, BI490	BI109, BI111, BI120, BI121, BI201, BI203, BI204, BI213, BI214, BI219, BI275, BI305, BI320, BI324, BI325, BI327, BI331, BI340, BI360, BI407, BI422, BI425, BI437, BI438, BI439, BI443, BI444, BI490
How and in what <u>course(s)</u> do they demonstrate that they have <u>achieved</u> this outcome.					
Formative Assessment will occur in ...	BI120 / 121	BI120/121	BI201	BI 120/121 and BI204	Department Values Survey administered at start of BI120

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Summative Assessment will occur in...	MFAT on exit Upper level elective classes (those composed of at least a 60% of seniors) being offered in year when this LO is being evaluated (BI305, BI320, BI324, BI325, BI327, BI331, BI340, BI360, BI407, BI422, BI425, BI437, BI438, BI439, BI443, BI444, BI490)	Upper level elective classes (those dominated by seniors) being offered in year when this LO is being evaluated	BI444	BI444 (oral) BI305 (written) For oral presentations: BI444 For Scientific Writing: BI305	Department Values Survey administered at end of final semester at GCU

Assessment Protocol

How and when do you assess the achievement of *all students* in your program before they graduate and record the results of your assessment?

Formative Assessment

Direct Evidence	Item analysis from targeted questions on comprehensive final exams.	Rubric Driven Assessment during laboratory practicals Rubric Driven Assessment of Targeted Lab Assignments	Rubric Driven Assessment of Written Assignments requiring summary and analysis of primary scientific papers in Bio lit (BI201)	Rubric driven analysis of oral presentations in BI120 (Biological Diversity), BI121 (Biological Unity) and of rubric driven analysis of formal laboratory reports prepared in BI204	
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				(Biological Continuity)	
Indirect Evidence	Student responses on SIR sections D,F, G, and I as well as overall scores	NA	Midterm and Final grades in BI201 SIR scores from sections of D,F,G and I of the student course evaluations.	NA	Administration of departmental self-survey At start of BI120
Summative Assessment					
Direct Evidence	Item analysis of final exams from selected courses composed of at least a 60% of seniors. MFAT upon exit from program (administered at end of final semester)	Rubric driven assessment of signature lab exercises / assignments within level elective classes being offered in year when this LO is being evaluated. MFT	BI444 : Rubric Driven Assessment of Signature Assignment requiring summary and analysis of primary scientific papers	Rubric driven analysis of oral presentations in BI444 (Senior Seminar), and of rubric driven analysis of Scientific Writing in BI305	All students will earn certificate from NIH on human-subjects research prior to graduation.
Indirect Evidence	Student responses on SIR sections D ,F, G, and I as well as overall scores Program satisfaction survey administered to Senior graduates.	Self assessments completed by students rating their comfort / proficiency with key laboratory and field methods skills	SIR scores from sections of D, F, G and I of the student course evaluations.	NA	Administration of same departmental self-survey at end of BI444
What do you consider satisfactory achievement of this outcome? WHY?					

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Formative Assessment					
Direct Evidence	For item analysis 80% of biology majors will score 70% or better on each of the subject areas targeted in the item analysis of the cumulative section of the final exams.	For rubric guided assessments of students' lab practicals, 75% of students will achieve at or above the developing level (level 2 of 4) for all rubric criteria. For Rubric Driven Assessment of Targeted Lab Assignments 75% of students will achieve at or above the developing level (level 2 of 4) for all rubric criteria.	80% of students will achieve at or above the developing level (level 2 of 4) for all rubric criteria.	80% of students will achieve at or above the emerging level (level 2 on a 6 point scale) for all rubric criteria on their oral presentations in BI120 and BI121 80% of students will achieve at or above the developing level (level 2 of 4) for all rubric criteria on their formal lab report in BI121	100% of students complete the survey. Results retained for comparison with administration of survey to students at senior level.
		NA	Scores on SIR section F for BI201 will meet or exceed the average comparison score for all similar courses	NA	NA
Summative Assessment					
Direct Evidence	85% of students will achieve MFAT scores above the mean	For rubric guided assessments of students' lab	80% of students will achieve at or above the accomplished	80% of students will achieve at or above the accomplished	Improvement in scores on each values item assessed

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	<p>in at least one of the 4 subscores for content areas on the MFAT, and 50% or more will score above the mean in 2 or more content areas.</p> <p>80% of students will correctly answer at least 75% of the questions whose objectives align with the outcome. (Courses will be selected from term offerings where at least 60% of students are at senior status.)</p>	<p>practicals, 85% of students will achieve at or above the developing level (level 3 of 4) for all rubric criteria.</p> <p>For Rubric Driven Assessment of Targeted Lab Assignments 85% of students will achieve at or above the developing level (level 3 of 4) for all rubric criteria.</p>	<p>level (level 3 of 4) for all rubric criteria.</p>	<p>level (level 3 on a 4 point scale) for all rubric criteria on their oral presentations in BI444</p> <p>80% of students will achieve at or above the accomplished level (level 3 of 4) for all rubric criteria on their formal lab reports in BI305</p>	<p>relative to the same scores on the survey given during the formative period</p>
Indirect Evidence	SIR scores in sections D,F,G,I and overall score for each course assessed will meet or exceed the average comparison score for all similar courses	Student responses to departmentally administered self assessment of student's comfort level with key field and laboratory skills needed for professional success	Scores on SIR section F for BI444 will meet or exceed the average comparison score for all similar courses	NA	NA
Program Assessment Time Frame					

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Time Frame for Assessing the outcome.	<i>Year 1</i>	<i>Year 3</i>	<i>Year 2</i>	<i>Year 2</i>	<i>Year 3</i>

GCU Program Assessment Report Form

<i>GCU Academic Program Assessment Annual Report</i>
<i>Program:</i>
<i>Division:</i>
<i>Date:</i>
<i>Program Assessment Liaison:</i>
Based on the above plan and the designated outcome(s) assessed for the academic year, the major program submits a Program Assessment Report annually that contains the program assessment plan, assessment data and analysis, and action steps to be taken by the program based on these results. See below for the outline of this report.
Learning Outcome(s) Assessed:
Description of the Assessment Protocol.
Assessment Data and Findings.
Analysis of Data:
Are these results satisfactory? Why or Why not?
Action Plan based on Assessment Results and Analysis:
Time Frame for Action Plan:
What actions have been taken since the previous assessment of these outcomes?
Comments:

Assessment Data: Please include the data that you used to complete the above report. Attach rubrics, tallies, and method of validation.