

## End of Year Assessment Report for Programs

Program: Biology

Semester/year: 2018/2019

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### Program Mission Statement

The Department of Biology is committed to excellence. Our mission is two-fold. First, preparing graduates in the biological sciences who demonstrate open-minded inquiry, integrity, service, and stewardship of God's creation. Second, helping students in the liberal arts better understand and appreciate their role in God's created order. We see this commitment as an affirmation of the mission of Greenville University.

### Program Objectives

1. Think like a biologist
  1. Demonstrate working knowledge of major areas of biology as identified in the biology major (cellular/molecular, anatomical, ecology).
  2. Describe ethical dimensions of biological issues and articulate links between the study of biology and a Christian worldview.
2. Work like a biologist
  1. Design studies, collect and analyze data to answer biological questions
  2. Appropriately utilize scientific literature
  3. Demonstrate standard laboratory skills
3. Communicate like a biologist
  1. Orally present scientific information effectively
  2. Communicate scientific information in written form effectively

## Assessment Methods and Benchmarks – FULL YEAR

For each program objective, choose one “best representative” assignment at the Introductory, Developmental, and Mastery levels. You will have a total of three assignments/measurements per program objective. Put this information in a chart. Refer back to your Program Learning Objective Alignment Chart to determine best representative assignments and benchmarks. In any given semester, you may not have assignments at all three levels for every program objective; simply report all that you can.

Program Objective	Introducing	Developing	Mastering
1.1. Think like a biologist: Demonstrate working knowledge of major areas of biology as identified in the biology major (cellular/molecular, anatomical, ecology).	BIOL110; Gram Stain Lab Benchmark: >=70% Evidence: 90% completion	BIOL370; Sum of COs 1-3, Mendelian Genetics Lab assignment; Fundamental Concepts Exam Questions Benchmark: >=70% Evidence: 80%	Not yet mapped
1.2. Think like a biologist: Describe ethical dimensions of biological issues and articulate links between the study of biology and a Christian worldview.	BIOL360 Antibiotics Exam Benchmark: >=65% Evidence: >95%	UNIV301: Term paper or mid-term Benchmark: >= 70% Evidence: 91%	BIOL410 CLO Faith/Ethics reflection paper Benchmark: >=70% Evidence: 71% completion
2.1. Work like a biologist: Design studies, collect and analyze data to answer biological questions	BIOL112; Independent experiment Benchmark: >=70% Evidence:	BIOL370; Lab Project Benchmark: >=70% Evidence:	BIOL410 Paper Introduction and Data Use grades Benchmark: >=70% Evidence:
2.2. Work like a biologist: Appropriately utilize scientific literature	BIOL110 Labs 1-5 Benchmark: >=80% Evidence: > 95% Completion	BIOL370; Primary Literature Not assessed this year Not assessed this year	BIOL410; Literature Use grade Benchmark: >=70% Evidence: 93% Completion
2.3. Work like a biologist: Competently utilize standard laboratory or field techniques	This program objective is still being developed - we are working to develop a list of lab competencies that we can develop across all our labs.		
3.1. Communicate like a biologist: Orally present scientific information effectively	Not yet mapped	BIOL 305 Oral presentation on molecular biology techniques Benchmark: >=70% Evidence: 100% Complete	BIOL410; Presentations Benchmark: >=70% Evidence: 100% Complete
3.2. Communicate like a biologist: Communicate scientific information in written form effectively	BIOL112 written lab report Benchmark: >=70% Evidence: 60% Completion	BIOL360 Unknown Lab Reports 1 & 2 Benchmark: >=70% Evidence: 80% Completion	BIOL410; Research Paper Benchmark: >=70% Evidence: 86% Completion

## Analysis of Assessment Findings – FULL YEAR

**NOTE** – the way our curriculum works it does not make sense to complete this analysis and reflection on a semester-by-semester basis.

*Discuss the significance of the findings of the current semester in light of the desired results, findings from previous semesters/years, recent changes in the program or the assessment process, etc. What did you learn from the assessment? In particular:*

(1) *What strengths and weaknesses do the findings reveal about the program and/or the assessment process?* The biggest weaknesses this reveals is that our assessment process is fundamentally hampered by conflicting goals: To maximize assessability, program objectives need to be specific and granular. This implies the need for many program objectives to span all the goals of a robust academic program. However, the mandate to assess each objective at three levels (I, D, M) means that we then need to have three nearly identical assignments to closely match the program objective. This also implies that we need to quickly stabilize all the assignments across all of our courses that feed into this multi-tentacled assessment beast. Pushing in the opposite direction are the need to streamline the assessment process (driven in part by the deep desire of faculty to spend more time teaching and less time on paperwork), and the need to allow courses and assignments to develop and improve. **This mismatch of goals is fundamental to this model of assessment! Educating students is not like manufacturing widgets, and as long as we try to assess learning like we are running an assembly line, we will have this problem. The best we can do under this model is an unhappy truce between these conflicting objectives.**

(2) *What impact have program changes in the last several years had on student learning (indicate those program changes that resulted from previous assessment findings)?* We have made changes in the assessment process, particularly in changing program objectives. We have elected to simplify program objectives. PO 2.1 (*Work like a biologist: Formulate testable hypotheses*) and 2.2 (*Work like a biologist: Collect, Analyze, and Interpret Data*) have been combined into “*Work like a biologist: Design studies, collect and analyze data to answer biological questions*”.

(3) *What impact have recent changes in the assessment process had on the quality and usefulness of the findings? Of particular importance to note are recent changes and improvements in the program that resulted from previous assessment efforts. (The two sentences of this prompt don't seem to be related – the first is about changes in the assessment process and the second is about changes in the program.)* See comments on (1) re: quality and usefulness of the “findings”.

## Sharing and Discussion of Assessment Findings – FULL YEAR

We spent time in several department meetings this year considering ways to improve our program objectives, as they are the foundation of this process. At this point, most of our program improvements are driven by our own anecdotal observations, and not by the limited scope of what this assessment data can tell us (see comments above on (1) about the conflicting goals).

## Use of Assessment Findings for Program Improvement (Action Plan) – FULL YEAR

*(A) Describe any changes in (1) the program and/or (2) the assessment process that are planned in response to these assessment findings.*

(A.1)

- 1) Based on lack of laboratory skills noted in BIOL 340 (Cell Biology) in the Fall of 2018, we have changed future offerings of BIOL 340 to spring semester, and made BIOL 360 (Microbiology) a prerequisite for Cell Biology.
- 2) Based on the need to assess more effectively and the need to make the course more uniform, we are working to standardize practicum (both BIOL 395 and 405) and readings (BIOL 390). This includes creating master courses on D2L with standard gradebooks for both classes.

3) While we want to include oral presentation as a standard part of practicum, the end of semester in the new academic calendar is so compressed that we have not been consistently able to find a time in which to have students present their practicum. We need to decide whether to drop this as a requirement.

(A.2) We elected to combine the previous PO 2.1 and PO 2.2 as noted above. We also created PO 2.3: “Work like a biologist: Competently utilize standard laboratory or field techniques”. We are in the process of defining a core set of skills a graduate in biology should have mastered. Over the next year we will map these to lab activities in our courses, and determine how we will assess them within the program.

*(B) Briefly summarize the status of the previous years’ or semester’s action plans. Are they complete, still being implemented, on hold, or some other status?*

The five goals identified in last year’s action plan are listed here with comments.

4) Better define some of the program objectives (specifically 1.1). *This should be completed in Fall 2018.*

We have not made progress on this. Two factors account for this: 1) Unforeseen changes in departmental personnel caused by Dr. Kautu’s unplanned leave of absence and the department being short-staffed in the fall of 2018. 2) Focus of our limited resources on other changes noted below.

5) Map assignments to PO 1.2. This may only have assessment at the D level. *This should be completed in Fall 2018.*

We have completed this mapping, and presented data here based on this mapping. We utilize data for Biology majors from UNIV 301 for the M level. This included creation of a new assignment in BIOL 410, which may be further revised over the next year.

6) Consider revising PO 2 to include reference to specific laboratory skills, as this process was begun several years ago. *This is a longer-term goal, and should be addressed in the 2018-2019 academic year.*

We have revised PO 2, and are in the process of creating a skills inventory. The abrupt changes in departmental personnel have delayed this process, and we expect to make more progress in the 2019-20 academic year.

7) Revise some assignments to make the assessment of program objectives more specific (PO 2.1, 2.2, 2.3, and 3.3). *Needed changes should be identified in Fall 2018.*

We have combined PO 2.1 and 2.2 to simplify assessment. We concluded that PO 3.3 was implied in PO 1.1, and so have elected to drop PO 3.3.

We are considering further combining PO 3.1 and 3.2 to further streamline assessment.

8) Extend our assessment efforts to include advising (PO 2.4). This makes sense from the perspective that advising is an important activity that the faculty department carry out, and it is heavily based on our curriculum (but also includes Gen Ed requirements). It is a challenge however because it does not produce “assessable artifacts” at present, and the advising workload is heavy enough that we need to think carefully about how we gather assessment data without unduly burdening faculty. This is a more major project, and we probably don’t want to rush this. We should develop a plan to address this issue by the end of the year (Fall 2018).

Upon further discussion we determined that both assessment and advising already demand so much time from faculty that attempting to combine these two would create a large burden on faculty. **The fact that advising is not explicitly part of this assessment plan does not mean that we are not working to improve it. Rather, it means that the rigid format of this assessment process forced us to work on advising outside the confines of this rather rigid process.**

*(C) For each intended improvement or change in the program stemming from this semester’s data, provide a detailed timeline for follow-up data collection, data analysis, and data review.*

1) Develop a specific list of laboratory skills that should be taught across the curriculum (Fall 2019) and determine how to assess the success of learning these skills (Spring 2020).

2) Determine whether to combine PO 3.1 and 3.2 (Fall 2019)

- 3) Review the BIOL 110 and BIOL 112 curriculum and textbook, including the supplemental instruction program (Summer 2019 - Spring 2020)
- 4) Complete revision of BIOL 395/405 to include a standard gradebook (with rubrics), and determine if/how oral presentation will be included in the gradebook. (Fall 2019)
- 5) Complete revision of BIOL 390 to include a standard gradebook (with rubrics).(Spring 2020)

**Full Year Reflection - FALL/INTERTERM/SPRING TERMS**

See above

**Supporting Documents**

[If you attach any supporting documents, please list them here. You may submit these supporting documents into the D2L dropbox.]