

# Program Assessment Report 2016-2017

**Program:** Biology

## Program Learning Description

3). Critically evaluate biological data. (Developed.)

**Identify the artifact(s) (i.e. student work or outputs) that you used to assess the PLO. [Projects, papers, presentations, portfolios, exam questions, specific assignments, capstone work]**

(Emerging.) Biology majors must successfully complete two of thirteen upper level Biology courses to satisfy this PLO (with some alternative mechanisms also possible). Artifacts used to assess the PLO vary somewhat among those courses, but have been specified for each of the nine courses covered by this assessment. The specific assignments include laboratory reports, oral presentations, or specific exam questions that relate to this PLO.

### Other artifact(s)

**Identify the instruments (e.g. rubrics, surveys, spreadsheets, statistical software) used to assess the artifact(s) (i.e. the way in which student output are analyzed).**

(Developed.) Almost universally, rubrics were used to grade artifacts. Spreadsheets were then often used to compile and analyze the results obtained by the application of the rubrics. The rubrics were either explicitly shared with students in advance of the student's work on the assignments, or the rubrics paralleled detailed instruction that students were given to help them master the PLO and carry out the assignments that would be used to assess the PLO.

### Other instruments Used

Specific assignments

**Describe program collaboration to plan, implement and use the results of assessment.**

**Explain the results of the assessment activities.**

**Where applicable, outline the steps you will take to make improvements to the program based on the results of assessment activities identified in #3.**

(Developed.) Student achievement of this PLO was high within the courses employed to implement the PLO. Almost universally, students had multiple assignments intended to instruct and provide experience in critically evaluating biological data. Often, the assignments progressively increased in their level of complexity. A benchmark grade of 74%, equivalent to a C, was applied. In all but one course, more than 84% of students exceeded the benchmark. In many courses, 100% of the students exceeded the benchmark.

However, the artifacts used to assess the benchmark often incorporated into their grade elements (such as writing style and grammar) that were not directly relevant to achievement of the PLO. The proportion of a grade attributable to non-relevant artifact elements occasionally approached 40% of the artifact

grade. It will be up to the faculty, upon review of the assessment report, to design artifacts that can more directly assess this PLO and yet still be simply incorporated into grading of course assignments. Nevertheless, the instruction directed at the PLO is robust and the artifacts currently used are, in the main, largely assessing the PLO, leading to the projection that more direct assessment of the PLO will only reinforce the conclusion that the PLO is being well met.

**Are there any new resources needed to create program improvements? If so, please include the resources that you will request in the Budget section of the Annual Report.**

(Emerging.) The department will discuss the outcomes of the PLO assessment and will have as a goal the development of artifacts that can more directly assess the PLO, without being diluted by assessments that are more appropriately directed at other PLO's of the program (such as PLO's 5 and 6, which address written and oral communication). For example, it will be suggested that artifacts that require students to critically evaluate previously unseen biological data be incorporated into class exams, expressly with the purpose of serving as artifacts that directly assess this PLO. The discussion will also enable the sharing of best practices for training students in the achievement of this PLO.

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## Program Learning Description

4). Demonstrate mastery of the scientific method.

**Identify the artifact(s) (i.e. student work or outputs) that you used to assess the PLO. [Projects, papers, presentations, portfolios, exam questions, specific assignments, capstone work]**

(Stage: Emerging) - Artifacts varied somewhat from course to course, but primarily included laboratory reports and oral or poster presentations.

### Other artifact(s)

**Identify the instruments (e.g. rubrics, surveys, spreadsheets, statistical software) used to assess the artifact(s) (i.e. the way in which student output are analyzed).**

(Stage: Developed) - Almost universally, rubrics were used to grade artifacts. Spreadsheets were then often used to compile and analyze the results obtained by the application of the rubrics. The rubrics were either explicitly shared with students in advance of the student's work on the assignments, or the rubrics paralleled detailed instruction that students were given to help them master the PLO and carry out the assignments that would be used to assess the PLO.

### Other instruments Used

Specific assignments

**Describe program collaboration to plan, implement and use the results of assessment.**

**Explain the results of the assessment activities.**

**Where applicable, outline the steps you will take to make improvements to the program based on the results of assessment activities identified in #3.**

(Stage: Developed) - Student achievement of this PLO was high within the courses employed to implement the PLO. In some courses, students had multiple assignments intended to instruct and provide experience in carrying out the scientific method. In those cases, the assignments progressively increased in their level of complexity. A benchmark grade of 74%, equivalent to a C, was applied. In all but one course, more than 84% of students exceeded the benchmark. In one course, 60-75% of the students exceeded the benchmark. (The scoring provided made it difficult to come up with an exact number.) In one course, 100% of the students exceeded the benchmark.

In four of the five courses assessed, the exact same artifacts and rubrics used to assess PLO 3 were also used to assess PLO 4. Our approach could use improvement. For example, using in their entirety laboratory reports, oral presentations and poster presentations to assess PLO 4, mastery of the scientific method, seems appropriate, as elements such as introductions, as well as writing style and grammar are directly relevant to achievement of the PLO. However, more prescribed exercises that teach students

how to critically evaluate biological data (PLO 3) seem less appropriate examples of mastery of the scientific method in its entirety. It will be up to the faculty, upon review of the assessment report, to design artifacts that can more directly assess this PLO and be easily incorporated into grading of course assignments. (One faculty member already has plans to design separate rubrics for PLO's 3 and 4, based on his current assessment of these PLO's.) Nevertheless, the instruction directed at the PLO is robust and the artifacts currently used are, in the main, largely assessing the PLO, leading to the projection that more direct assessment of the PLO will only reinforce the conclusion that the PLO is being well met.

**Are there any new resources needed to create program improvements? If so, please include the resources that you will request in the Budget section of the Annual Report.**

(Stage: Emerging) - The department will discuss the outcomes of the PLO assessment and will have as a goal the development of artifacts that can more directly assess each PLO, without being diluted by assessments that are more appropriately directed at other PLO's of the program, as described directly above. The discussion will also enable the sharing of best practices for training students in the achievement of this PLO.