

Course Outcomes Guide (COG)

Directions: Please complete this form to document your progress toward improving student learning. For each item, indicate your progress and your anticipated next steps. Thank you!

Course Title: Principles of Biology Bio113

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Expected Learning Outcomes:

1. Students will demonstrate scientific literacy by effectively locating, evaluating, and communicating scientific information in oral, written, and/or visual formats.
2. Students will demonstrate familiarity with fundamental experimental design, laboratory technique, and data analysis.
3. Students will apply critical thinking skills to solve scientific problems.
4. Students will demonstrate a fundamental understanding of biological concepts including: the scientific method of inquiry, biological chemistry, bioenergetics, cellular and molecular biology, and genetics.

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

- 3 multiple choice / short answer exams (100 pts each)
- 1 cumulative Common Final Exam (100 pts) (attached, Appendix A)
- 15 lecture homework assignments (P/F, 10 pts each)
- 10 online lecture quizzes (high ten, worth 10 points each)
- 10 lab quizzes/assignments (20 pts each) (2 selected assignments attached, Appendix B)

Validation (What methods have you used or will you use to validate your assessment?)

Online homework assignments and quizzes are assessed automatically by educational software designed by the publisher of the course textbook. Each assessment item is linked to a specific learning objective and ranked by difficulty level 1-5.

All assignments that include essay questions are not automatically graded are assessed using a common rubric.

The Common Final Exam has been developed in house. Student scores improved by more than 20% between pre- and post-instruction on the Bio113 Common Final Exam (attached, Appendix C)

The scores on the Common Final exam correlate with course grades.

Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

SLOA reports for all sections of Bio113 delivered in FY2016-2017 (attached, Appendix D)

Item analysis of the Bio113 Common Final Exam shows that student scores were lowest (~60% in Fa16 and Sp17) in the topics of cellular respiration, mitosis, and gene expression. (Attached, Appendix C)

Follow-up (How have you used or how will you use the data to improve student learning?)

In Fall of 2016 Bio113 course content and delivery was aligned to a student audience consisting solely of science majors without a chemistry pre-requisite. The removal of a chemistry pre-requisite may explain the low student scores on the topic of cellular respiration. The content for this topic will be reviewed by the team so that it properly aligns with pre-requisites for the course.

The idea that instructors simply run out of time to adequately cover the last topic of the semester, gene expression, is also supported by low student scores in this area. In order to improve instruction, without increasing time on task, online learning materials to support these topics will be reviewed. These materials can be made available online, with access and support through the Learning Support Center.

The questions and answer keys on the topics of cellular respiration, mitosis, and gene expression for the Bio113 Common Final Exam will be reviewed by the team for clarity and accuracy.

Budget Justification (What resources are necessary to improve student learning?)

Students rely heavily on Student Learning Center and Testing Center services for:

- Access to course materials, physical and online
- Printing of course handouts and notes
- Private tutoring
- Group study
- Learning assessment