Introductory Biology: Research Experience for Undergraduates Laboratory course
BIOS 11174

Current Course Objectives

This required course is designed to allow introductory biology students to participate in a semester long research project. Each section has 20 - 32 students. The learning goals are below. During the first half of the semester, we emphasized learning goals 1 , 2, and 3 where students were at the bench generating data.

1. Contribute to the creation of biological knowledge to generate novel experimental results.

2. Engage in the process of biological inquiry to develop an effective experiment including appropriate replication, randomization, and controls.

3. Apply quantitative techniques to biological problems

Adaptations for Remote Learners

Finishing the project:

We would ask graduate TAs and instructors to complete the lab work and send new data to students. These lab experiments will be captured as videos so students will still learn the techniques. Alternatively, data sets from previous years can be used. Students would be asked to do 1-2 hours of video work or reading per week. We would continue to use prework or postwork submissions using Sakai or Gradescope to keep students on track. We would also require a synchronous 1-hour session each week using Zoom.

Shift to Data Analysis and Writing:

We would shift our focus to learning goals 4, 5 and 6 earlier than usual if there is a disruption in instruction on campus. Although students will not be doing experiments themselves, much can be learned about the process of science by reading, discussing and writing about experimental data and conclusions that can be drawn from them.

4. Communicate biological concepts accurately and concisely in a scientific journal article format.

5. Use scientific literature to inform experimental design and analysis and place the research project in the context of current literature

6. Identify as a biologist including being an autonomous, self-learner, investigating questions independently, work in a collaborative manner with peers to generate ideas and solve problems.

Quizzes and Research Paper:

The remaining quiz will be done on Gradescope or Sakai where students will be sent a pdf of the quiz. They will then take a photo of each page and upload to Gradescope. Students will be given a window of time (24 hours) to do the quiz versus a specific 1 hour block. We will choose between an closed-book individual quiz or an open book individual quiz that asks intellectually deeper questions.

The paper submissions drafts will be done using Google drive. Grading of papers will be done using the comment feature in google drive and graduate TAs will be asked to have synchronous writing session with small groups of students for 30 minutes before each of the two drafts are due.