

CLARION UNIVERSITY OF PENNSYLVANIA

Clear Form

Required Cover Sheet for Curricular Changes
(Procedures for Implementing Curricular Change)

CATALOG INFORMATION

Department: Department of Biology and Environmental Sciences

Type of Change:

Form with checkboxes for New course, New program, New concentration, Change in requirements, Deletion of program, Experimental course, Special topics course, Credit change, Change in prerequisites, Cross-listed course, Deletion of course. Other: Reduction in laboratory meeting time

Course Number and Name or Program of Study Name: BIOL 165 Principles of Biology I lab

Course Description or Catalog Data:

Old Course Description:

Laboratory exercises augment and integrate course material emphasized in BIOL 155. Three hours laboratory weekly. For biology majors. Must be taken concurrently with BIOL 155 unless it is being repeated. Fall, annually.

New Course Description:

Laboratory exercises augment and integrate course material emphasized in BIOL 155. One hour laboratory weekly. For biology majors. Must be taken concurrently with BIOL 155 unless it is being repeated. Fall, annually.

Prerequisite: BIOL 155 co-requisite

Term and Frequency: (if applicable) Fall, annually

CIP Code (6 digits, e.g. 12.3456):

Go to: http://nces.ed.gov/ipeds/cipcode; search CIP codes link

Number of Credits: 1

fixed variable

Contact Hours(per week): 1

Workload Hours: 1

\*Course repeatable for additional credit? No Yes

Maximum credits allowable: 1

Expected Enrollment: 24

Check sheet Change: No Yes (attach check sheet with explanation)

Level: Undergraduate Graduate \*Undergraduate course (400 level only) allowable for graduate credit? No Yes

Component:

Form with checkboxes for Lecture, Lab, Seminar, Workshop, Co-op, Internship, Student teaching, Thesis research, Clinical, Research, Independent study, Field studies, Band, Performance group, Study abroad, Recital, Practicum

Course Modality:

Special Grading: None

Department of Record: (department responsible for administering course) Department of Biology and Environmental Sciences

Effective First Term: (earliest implementation date) Fall 2021

Effective Final Term: (deletion only)

Signature blocks for Department Chair, College Dean, and C.C.P.S. Chair with dates and change number.

Signature blocks for Faculty Senate Recommendation, President's Action, and University President with dates.

## **Changes to BIOL 165: Principles of Biology 1 lab**

### **Summary of Change**

- **Old:** 1 credit hour, 3 contact hours, 3 faculty load hours
- **New:** 1 credit hour, 1 contact hours, 1 faculty load hour

### **Old Course Description:**

Laboratory exercises augment and integrate course material emphasized in BIOL 155. Three hours laboratory weekly. For biology majors. Must be taken concurrently with BIOL 155 unless it is being repeated. Fall, annually.

### **New Course Description:**

Laboratory exercises augment and integrate course material emphasized in BIOL 155. 1 hour laboratory weekly. For biology majors. Must be taken concurrently with BIOL 155 unless it is being repeated. Fall, annually.

**Rationale:** We are trying to improve the transition from instructor-centered to student-centered learning for freshmen coming out of high school, and to focus on critical skills needed for long-term success in Biology programs. Our current curriculum required freshmen in all Biology related majors to take Principles of Biology 1 and 2. Each 3-hour lecture has a required 3-hour lab co-requisite worth 1 credit (and 3 faculty contact hours). We have struggled for years with the students' ability to function and retain key concepts in these long and content-laden laboratories. Additionally, the current laboratory is extremely costly in both staffing and materials and in the environmental impact to populations of wild-caught dissection animals and the methods necessary for their later disposal. All of this considered, we have determined that the cost when compared to the benefits of these models make them unsustainable. We are proposing that the lab be reduced from 3 hours to 1 hour.

There is precedent for this in the current catalog. ES 150 Physical Geology with Lab has a 50 minute laboratory period.

### **Change in learning outcomes**

In reducing the number of hours we are also putting more thought into the learning outcomes and content of these labs. We are developing more focused, intensive, and carefully developed activities that are designed to target a particular skillset each week with lots of repetition and application across different topics.

In the Fall, students will have practiced foundational skills that address each of the Biology program learning outcomes: Information Literacy, Inquiry and Analysis, Quantitative Literacy, and Written Communication. In the Spring, in this lab, the focus will be on applying those skills at a higher level towards several multi-week activities that will introduce new laboratory and

field skills, and a large field research project, completed in small groups. Our goal is to teach students undergraduate research skills formally, as part of our curriculum, so that all of our students are exposed and not just those who opt to do independent research with faculty. Students will present scientific research posters and give short oral presentations at the end of the course in a Biology Symposium, where faculty can formally assess our first year cohort on key program learning outcomes.

## **BIOL 165: Principles of Biology I lab**

### **Course Description**

Laboratory exercises augment and integrate course material emphasized in BIOL 155. One hour laboratory weekly. For biology majors. Must be taken concurrently with BIOL 155 unless it is being repeated. Fall, annually.

### **Course Goals/Learning Outcomes**

- Students will hone their analytical and problem-solving skills by exploring current scientific topics in short case studies developed from the primary literature. They will be assessed on their ability to analyzing evidence in these case studies, make inferences, and draw conclusions based on empirical data.  
*This supports the support the Biology program Inquiry and Analysis outcome.*
- Students will gain science communication skills by doing guided readings and summaries of primary literature, and by practicing pieces of the scientific writing process through scaffolded exercises.  
*This supports the Biology program Written Communication outcome.*
- Students will understand how to locate and use different source materials effectively and ethically, and practice those skills on several short writing assignments and by developing an annotated bibliography.  
*This supports the Biology program Information Literacy outcome.*
- Students will learn to use quantitative skills to observe, analyze, and depict biological phenomena, and to present their data in both graphical and tabular formats. This will be assessed through an Excel graphing exercise, and various lab activities.  
*This supports the support the Biology program Quantitative Literacy outcome.*

### **Course Co- or Prerequisite**

BIOL 155

### **Required Materials**

None

Lab exercises will be provided prior to labs via D2L

### Course schedule

| Week | Skillset                             | Activity  |
|------|--------------------------------------|---|
| 1    | Introduction                         |   |
| 2    | Observation and Inference-<br>part 1 | Interactive lecture, inferences and bias in science                 |
| 3    | Observation and Inference-<br>part 2 | Organism guessing game  |
| 4    | The Scientific Method-Part 1         | Practice with developing questions and hypotheses                   |
| 5    | The Scientific Method-Part 2         | Mini in-class physiology experiments<br>Short analysis for homework |
| 6    | Lab skills and protocols             |   |
| 7    | Information literacy- Part 1         | Library tools- conduct a mini in-class search                       |
| 8    | Information literacy- Part 2         | How to evaluate sources of information and APA<br>tutorial          |
| 9    | Science writing- Part 1              | Parts of a scientific paper   |
| 10   | Science writing- Part 2              | Guided paper analysis   |
| 11   | Quantitative literacy- Part 1        | Scientific data: variables, controls, data and graphing<br>types    |
| 12   | Quantitative literacy- Part 2        | Excel graphing lab  |
| 13   | Research - Application               | Fly Lab -Part 1   |
| 14   | Research - Application               | Fly Lab -Part 2   |
| 15   | Research - Application               | Fly Lab Reports due   |