

BIOL 36BH: HONORS EXPERIMENTAL RESEARCH IN BIOLOGY II

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2025
Units:	1
Hours:	3 laboratory per week (36 total per quarter)
Prerequisite:	BIOL 36AH.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU/UC
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Expand the scope of their research project to add to the current scientific understanding.
- Access scientific literature to understand and effectively communicate the scope and depth of the current understanding in the area of study.
- Learn new research techniques and develop further proficiency in the laboratory or field study techniques required to carry out the research project.
- Demonstrate critical thinking and problem-solving skills to troubleshoot experiments and research design.
- Effectively communicate research findings to both the scientific community and the public.

Description

This course provides students with an opportunity to carry out an authentic research project in biology. Students will further explore their original research project while exploring how to narrow and/or expand the scope of their research project as it develops. Additionally, students will gain valuable collaboration and skills by training and coordinating with students in BIOL 36AH. Emphasis is placed on scientific thinking, laboratory and/or field work skills, project design, coordination and implementation, bioethics, and scientific communication.

Course Objectives

The student will be able to:

- Carry out a novel research project to add to the current scientific understanding.
- Access scientific literature to understand and effectively communicate the scope and depth of the current understanding in the area of study.
- Discuss and evaluate the bioethical considerations of biology research.
- Proficiently and safely perform laboratory or field study techniques required to carry out the research project.

- Demonstrate critical thinking and problem-solving skills to troubleshoot experiments and research design.
- Effectively communicate research findings to both the scientific community and the public.
- Expand the scope of the project by integrating new student scientists into their research group.

Course Content

- Experimentation
 - Lab safety
 - Experimental design
 - Potential biases in experimental design
 - Equipment care and maintenance
 - Equipment operation and safety
 - Problem solving and redesign
- Data collection
 - Methods of data collection
 - Record keeping
- Data analysis
 - Methods of data analysis
 - Evaluation of results
 - Reliability of data
 - Bias in data collection and analysis
 - Accuracy and statistical standards
- Science communication
 - Science communication to other scientists
 - Abstract
 - Scientific format
 - Science writing
 - Presentations
 - Presenting data
 - Graphs
 - Tables
 - Figures
 - Science communication to the public

Lab Content

- Experimentation
 - Lab safety
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 - Potential biases in experimental design
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 - Equipment operation and safety
 - Problem solving and redesign
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 - Methods of data collection
 - Record keeping
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 - Reliability of data
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- a. Science communication to other scientists
 - i. Abstract
 - ii. Scientific format
 - iii. Science writing
 - iv. Presentations
- b. Presenting data
 - i. Graphs
 - ii. Tables
 - iii. Figures
- c. Science communication to the public

Discipline(s)

Biological Sciences

Special Facilities and/or Equipment

1. Fully equipped multi-media laboratory classroom with support of laboratory technician.
2. Materials and equipment such as glassware, chemical and biological reagents, microscopes (oil immersion capacity), gas outlets, autoclave, hot-air sterilizer, incubators, refrigerator, media preparation area, glass washing facilities, laboratory coats, disposable gloves, and safety equipment.
3. Students need internet access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Lab notebook and accurate record keeping

Science communication project: prepare a presentation, infographic, article, podcast, paper, or other form of presentation to communicate the purpose, scope, and current research results of the project to two different audiences, a scientist and a member of the general public

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture

Discussion

Cooperative learning exercises

Laboratory activities and/or field studies

Representative Text(s) and Other Materials

Knisely, Karin. [A Student Handbook for Writing Biology](#). 2021.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Laboratory notebook
2. Science communication project: prepare a presentation, infographic, article, podcast, paper, or other form of presentation to communicate the purpose and scope of the project to two different audiences, a scientist and a member of the general public
3. Presentation of data at research symposium, either in-class or a campus-wide symposium, such as the Research and Service Leadership Symposium (RSLs)