

BIOL C299: RESEARCH AND EXPERIMENTAL DESIGN

Item	Value
Curriculum Committee Approval Date	12/06/2024
Top Code	040100 - Biology, General
Units	1 Total Units
Hours	18 Total Hours (Lecture Hours 18)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

Introduction to the culture of science and research. Students will read and discuss research articles, write brief reports, give oral presentations and learn about lab safety, research ethics, scientific discourse and future career prospects. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Critically evaluate existing literature and effectively communicate findings.
2. Demonstrate the ability to formulate hypotheses, design reports to experiments, analyze data, and form conclusions.

Course Objectives

- 1. Formulate a research question.
- 2. Formulate a null and alternative hypothesis.
- 3. Select appropriate research methods to address the research question.
- 4. Collect and analyze data.
- 5. Interpret results in a written a research report.
- 6. Critically evaluate existing literature, and effectively communicate findings.

Lecture Content

Reading and evaluating scientific literature from peer reviewed journals
 Scientific Method Experimental design Statistical analyses T tests Chi square tests ANOVA MANOVA Nonparametric multidimensional scaling (NMDS)

Method(s) of Instruction

- Lecture (02)
- DE Online Lecture (02X)

Instructional Techniques

Instructional lectures, videos, literature review

Reading Assignments

Scientific literature from peer reviewed sources.

Writing Assignments

Summaries of scientific papers, research project proposals, discussion forums, presentations

Out-of-class Assignments

Reading, writing summaries of scientific papers

Demonstration of Critical Thinking

Presentation of findings in scientific literature, research proposal

Required Writing, Problem Solving, Skills Demonstration

Research project proposal, literature review

Eligible Disciplines

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required. Chemistry: Master's degree in chemistry OR bachelor's degree in chemistry or biochemistry AND master's degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Master's degree required. Ecology: Master's degree in ecology or environmental studies OR the equivalent OR see interdisciplinary studies. Master's degree required.

Other Resources

1. OERs, library databases, journal articles