

# SCED 495 – Undergraduate Research

Winter 2007

## General Information

Instructor: Dr. Ian J. Quitadamo

Office: Science 338K

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Meeting Time: F 10:00-10:50am

Office Hours: T 11-1pm

## Course Description

In this course, students will work closely with a faculty member to investigate a research topic of interest. This may include research in a biology faculty member's laboratory, performing science education research, or conducting an independent project. This variable credit course is typically taken toward the end of a student's course of study and is required as part of the Biology Teaching major and endorsement program.

## Prerequisites

Students must be admitted to the Professional Education Program and the Biology Teaching Program.

## Course Requirements

Texts and readings will focus primarily on primary research literature, and will be assigned as necessary. In order to succeed in this course, you must participate in the weekly research meetings. During these meetings, we will discuss your progress toward meeting the goals of your individual project. By the third week of the quarter, you will submit a project proposal. This proposal should summarize what you want to learn, what you plan to do, and relevant resources you will use to conduct your research. Although not all students are able to accomplish it, the ultimate goal of this course is to help students publish their work in peer-reviewed journals.

## Specific Learner Outcomes

By the end of this course, you will be better able to:

- Understand, apply, and value the processes of science.
- Develop biology and biology-related knowledge and skills via self-directed study.
- Use appropriate methods to analyze a biological or biology education-related system.
- Communicate scientific ideas to peers and the general public through various means.

*Note: These outcomes correspond to specific biology teaching program goals.*

## Evaluation

Your grade will be based on the following components:

<i>Component</i>	<i>Points</i>
Participation in weekly meetings/updates	20
Research proposal	20
Paper or poster	50
Reflection/critique	10
Total	100

## Description of Course Requirements

*Weekly Meetings:* Once a week, you will meet with the instructor to discuss research progress, to work on your project, or to brainstorm future actions. Your grade will be based on how well prepared you are for these meetings. For example, if you and the instructor agree on something being done by the following week, it must be done to get full participation credit for the week.

*Research Proposal:* Writing a research proposal should help you clarify your project to people who are not familiar with your discipline. For this reason, a successful proposal should be written in such a way that an intelligent reader who is not familiar with your field can still understand the research question you are proposing and the significance of your project in a larger context. The effectiveness of your proposal will depend on your ability to explain the nature, context and scope of the project. Your proposal should include the following information:

- Abstract (5 points)  
A summary of your research question and your project design. Researchers typically write the abstract after they have finished writing the rest of the proposal. Include it as the first section on the first page of your proposal.
- Research Question and Significance (10 points)  
What is the question that you want to explore in your research and why is it an interesting and important question? In thinking about the significance, try to take the position of an average newspaper reader. If she or he were to see an article about your research in the paper, how would you explain why this is an interesting project? Site *at least* three resources to support your question and significance.
- Working hypotheses and predictions (3 points)  
What are your working null and alternative hypotheses? What are the predicted outcomes of your study?
- Project Design and Feasibility (10 points)  
How will you go about exploring your research question? What will be your methods and timetable? How will this research fit into your schedule? Site *at least* two resources to support your project design and feasibility.
- Dissemination Plan (2 points)  
How will you communicate the results of your project? Do you plan to write a manuscript for publication, or present a research poster?

*Paper or poster:* As you conduct your research during the quarter, you will develop a paper or poster that summarizes your work. Ideally, students will conduct research of sufficient quality that it is accepted for publication following peer review. Alternatively or in addition, you may present the poster at a session with other research projects (e.g. SOURCE). Your dissemination plan must be clearly outlined in your proposal.

*Reflection/rubric:* You will compose a reflection regarding your project and progress during the term.