

Biology 495 Directed Honors Research Summer 2009

1. Meetings and Faculty

1.1. Meetings

IST Lab meetings are held Fridays at 1pm in Wesselkamper 116.

1.2. Faculty

Coordinator

Dr Helen Turner

(hturner@chaminade.edu)

1.2. Office Hours.

Office hours with Dean Turner are by appointment.

2. The Course.

2.1. Overview.

Directed Honors Research is an elective course for the bachelor's degree in biology at Chaminade University and is a culmination of the course of study in biology. The steps that you follow here are quite similar to steps taken by biologists in a wide variety of research labs, from generating ideas and research proposals to collection and analysis of data and finally to the presentation of results to other scientists (including those at granting agencies) through a written publication and or a public presentation. The weekly meetings with the research mentor, Dr Turner, will be used to review project progress and to perform exercises that aim to increase your knowledge of topical issues in the realms of biological discovery, scientific ethics and recent technical advances.

2.2. Learning Outcomes.

Successful completion of this course should provide students with the following learning outcomes:

1. Demonstration of the ability to organize and perform biological research using the scientific method.
2. Demonstration of the ability to complete a library search of biological literature.
3. Demonstration of understanding problems involved in conducting research in biology.
4. Demonstration of the ability to critically analyze data.
5. Demonstration of competency in using biological techniques and instruments
6. Completion of writing up research as a scientific paper formatted for submission to a peer-reviewed journal.
7. Completion and presentation of a poster documenting the research project for an audience of peers and professional scientists.

3. Requirements and Grading

3.1. Grading Scheme

Attendance and participation in weekly meetings	50 points
Final Poster Presentation	100 points
Final Written Paper	50 Points

Grade A = 90% or above

Grade B = 80% or above

Grade C = 70% or above

3.2. Course requirements.

The course is composed of:

1. Weekly discussion meetings with some assignments
2. You should aim to spend at least 15 hours per week on your research project for an 8 week period. Be aware that this is a minimum and the nature of biological research means that it is sometimes time-consuming and unpredictable.

The required products of this course are:

1. A poster documenting your literature research project which you are required to present in our mini-symposium. A single sheet poster will be required. The poster will include title, authors and affiliations, abstract, background, methods, results and data, discussion, literature cited and acknowledgements. Powerpoint templates for poster design are recommended and will be provided on request by Dr Turner. At the mandatory poster presentation session you should be prepared to give a brief oral presentation of your poster and answer questions from faculty and your peers. This will be held on campus in week 12/13 of the Fall semester. The date of this symposium will be announced in class.

2. A research paper formatted in accordance with the guidelines for submission to the Journal of Biological Chemistry (see http://www.jbc.org/misc/ifora.shtml#_Organization_of_the_Manuscript). Required elements of the paper are:

- **Title page:** title of your research project, your name, course and date of submission.
- **Abstract:** standard abstract form that presents your research (including results) in less than 200 words.
- **Introduction:** a review of literature, hypothesis and rationale of your research project. What is known about your area of interest and about your specific question(s)? What is not known? Where does your work fit in and contribute?
- **Methods and Materials:** a detailed description of techniques, instruments, experimental and control groups and flow-charts if needed.
- **Results:** data tables, figures, photographs and brief narrative of each.
- **Discussion and Conclusion:** a careful analysis of results, error analysis and proposals for additional work.
- **Literature Cited:** provides a complete list of work cited. Comply with the style of the Journal of Biological Chemistry.
- *The research must comply with the Chaminade University *Writing Across the Disciplines* standards.
- *The research paper and poster presentation (Power Point) must be submitted on a diskette or CD.

3.4. How to keep a laboratory notebook

- Completely number pages before recording data/writing in it.
- Use permanent ink.
- Include a complete Table of Contents at the beginning; all experiments should be dated and page numbers indicated. Include your mathematical calculations.
- Cross out errors—do not erase or use Liquid Paper.
- If data for a given experiment is to be collected periodically, leave sufficient space to enter the data over time. A data table might be appropriate in this case.
- Record data directly and do not tear pages out.

- The notebook is the property of the supervising investigator and should be surrendered to them upon completion of the project.

4. Policies.

- Class begins each time exactly at 8AM – please be on time. Chronic tardiness will be viewed as absence from class. If you miss or are tardy for class, please note that we will proceed without you and you will miss material; it is your responsibility to obtain missed lecture topics from your classmates who were in attendance.
- Please show respect to your fellow classmates: turn off cell phones and other electronic devices. Please respect classroom policies regarding food and other potential distractions.
- No make up time will be granted in the event the student fails to present a poster at the end of the semester at the appointed time. In the event of illness, a Doctor's note will be expected and accommodations will be made on a case-by-case basis.
- You are also expected to have read and to abide by the "Student Rules of Conduct" which are available in your copy of Chaminade University's Student Handbook.
- Regarding ADA accommodations for extra time on exams and quizzes; Please be aware that I can only accommodate your requests if you have a documented ADA agreement with Chaminade University on file at the Counseling Center.

5. Laboratory Guidelines.

General Guidelines for use of all Division of Natural Science and Mathematics Laboratories at Chaminade University.

1. Come to lab properly dressed. Bare feet, flip-flops, or sandals are NOT ALLOWED. You must wear a lab coat.
2. Do not eat, drink, apply cosmetics or chew gum in the lab. Do not place pencils, pens, labels, fingers (or any other objects) in your mouth. Keep your hands away from your face.
3. Never mouth pipette any liquid in any laboratory.
4. Keep cuts or open wounds covered. Gloves are available.
5. Work on the lab bench, not on your notebook, over the floor, or in your lap.
6. Keep your work area organized, to reduce confusion, chance of error, or chance of spilling. Put away unneeded notebooks, papers, and personal electronics.
7. If you work in a laboratory outside Chaminade you are required to follow all safety, dress and behavior regulations applicable in that institution.

Note: Every effort has been made to insure that the material in this syllabus is accurate and complete. However, occasionally changes must be made in the printed schedule. Thus the instructor reserves the right to make any changes in the contents of this syllabus that she deems necessary or desirable. These changes, if any, will be announced as soon as the need for them becomes apparent.