

**Biology 499 Directed Senior Research (3 credits)**  
**Chaminade University of Honolulu**  
**Fall 2000**

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**Directed Senior Research**, a requirement of the bachelor's degree in biology, represents the culmination of your course of study in biology. During your study of biology, you learned of many advances in the field. These advances were made possible by thorough and diligent scientific research. The Biology department holds research in such high regard, in fact, that it requires all majors to successfully execute original scientific research.

This semester, you will select your own research project, investigate literature on the topic, write a proposal for an experiment, conduct an investigation of the topic, collect results, and present results in a scientific paper and in a formal seminar.

As you select research topics, be advised that the Biology Department has adopted a moratorium on human, bird, and mammal studies.

**GOALS:** The goals of the course are:

1. to give you experience in organizing and performing biological research;
2. to gain experience in the library search of biological literature;
3. to give you further insight into problems associated with conducting research in biology;
4. to improve your ability to critically analyze data;
5. to increase your knowledge of and ability to use biological techniques and instrumentation;
6. to provide experience in writing a scientific research paper;
7. to gain experience in planning and presenting an oral presentation on original scientific research;
8. to increase your knowledge of a biological topic in detail.

**STUDENT OBJECTIVES:** At the completion of the course, you should be able to:

1. do a literature search of a research topic using primary, secondary, and tertiary sources;
2. design and conduct a research project pertaining to that topic;
3. write a scientific research paper using acceptable style and format;
4. present a scientific report, using appropriate visual aids;
5. answer questions posed about your research project during and after an oral presentation.

**TEXT:** There is no text for this course. Biology 490, Coordinating Seminar, is the prerequisite for this course, and materials presented in Biology 490 will serve as supporting materials for Biology 499.

**NOTEBOOK:** You will be required to keep a bound laboratory notebook.

1. Pages are to be completely numbered before anything is recorded in it. Permanent ink must be used.
2. A Table of Contents must be included at the beginning of your notebook and all experiments should be dated and page numbers indicated.
3. Any mathematical calculations should be entered in the appropriate places.
4. Recording errors should be crossed out, and never erased or covered over (with something like Liquid Paper).

- 6. If data for a given experiment is to be collected periodically, leave sufficient space to enter the time. A data table might be appropriate in this case.
- 6. Data should be recorded ~~directly into the~~ bound laboratory notebook, and not on loose scraps of Paper should never be torn from the notebook.
- 7. The notebook will be checked periodically, and will be submitted with your final research paper.

**RESEARCH PAPER:** The research paper will include the following components:

- 1. Title page: title, your name, course, date
- 2. Abstract: standard abstract to include results of your research
- 3. Introduction: including review of literature, hypothesis, and rationale for the research project;
- 4. Methods and materials: including detailed descriptions of techniques, instruments, experimental and control groups, and flow-charts;
- 5. Results: including data tables, figures, and photographs;
- 6. Discussion and conclusion: including a careful analysis of results, error analysis, and proposals for additional work;
- 7. References: provide a reference list of work cited  
Comply with the style of a biological journal or **AIBS** (Am. Institute of Biological Science) Style Manual.

**ADDITIONALLY,**

- 8. The research paper must comply with the Chaminade University Writing Across the Disciplines standards;
- 9. The research paper and seminar powerpoint presentation must be saved and submitted on a diskette or a CD.

**SEMINAR PRESENTATION:** Your seminar presentation must include a Powerpoint presentation. It should be roughly 25-30 minutes in length, including 5-10 minutes for questions from the audience. You will be required to provide outlines and key references for the audience. A videotape will be taken of your presentation, to be kept on file in the biology department with your research paper.

**MEETINGS:**

There will be group and individual meetings throughout the semester. These meetings are mandatory, and will result in a reduction of your grade if missed in excess (to *be* determined by the instructor).

Please note weeks when individual meetings are formally scheduled. It is responsibility to arrange these meetings.

**POLICIES:**

- 1. Assignments must be turned in as scheduled. Unless otherwise noted, assignments are due no later than 4 p.m. on the day they are due. The Biology Department's policy of one grade level reduction for lateness within 24 hours of due date and failure after 24 hours will be followed.
- 2. Incompletes are highly discouraged.
- 3. Students will be responsible not only for normal maintenance of laboratory equipment and supplies, but also the timely cleanup of their research. Failure to properly maintain and cleanup research supplies and equipment will result in a reduction of the final grade.
- 4. Last day to withdraw from class: **MONDAY NOVEMBER 13 2000**

## GRADE DETERMINATION:

Group and individual meetings	20%
Notebook	15%
Protocol, Progress reports, Rough Draft, Assignments	30%
Research Paper	20%
Seminar	15%

DATES: Mark these dates in your calendar!

Week	Date(s)	Assignment
1	Aug 30(W)	Group Meeting
2-3	Sept 5-15	Individual Meetings
3	Sept 13	Protocol Due
5	Sept 25	Individual Meetings
7	Oct 11	Progress Report # 1 Due
9	Oct 23-27	Individual Meetings
11	Nov 6	Progress Report #2 Due
	Each student will be informed by Nov. 6, 2000 whether sufficient progress has been made. Those not making adequate progress will be asked to withdraw from the course.	
12	Nov 13	<u>LAST DAY TO WITHDRAW FROM COURSE</u>
	Nov 17	Rough draft and outline of Seminar Due
13	Nov 20-22	Individual Meetings
14-15	Nov 27-Dec 8	Seminar Presentations
16	Dec 13	Research Paper due by 4 pm

Every effort has been made to insure that the material in this syllabus and course outline 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 or in the course of study that he/she deems necessary or desirable. These changes, if any, will be announced as soon as the need for them becomes apparent.

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**IWAMOTO, LEE-ROBINSON**

**LABORATORY PROJECT PROPOSAL**

Name of Investigator:

Date Submitted:

Project Title:

Goals **and** Objectives:

Procedures and Methods:

**Materials** (cost per item):

References:

**Instructor's** approval  
Comments:

Date