FD '02

Course Syllabus for Biology 210-Biological Techniques
Fall 2002
Chaminade University of Honolulu

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| Meeting time & place: | Monday 2:00-4:50 PM Henry Hall 13 |
| Textbook: | No text; several handouts including excerpts from the *Chemical Hygiene Plan at Chaminade University* and *Basic Laboratory Methods for Biotechnology* (Siedman & Moore). Additional materials on safety, protocols, techniques and instruments will be distributed during the semester. |
| Instructor: | Dr. Joan Kuh |
| Office & Contact Info: | 16 Henry Hall, 735-4807 (phone), jkuh@chaminade.edu (e-mail)<br>*Office Hours:* WF 12-2, T 1-2 or by appointment |

Course Description:

Biological techniques refers to the methodology, skills and instrumentation utilized in the natural sciences, specifically the *biological* sciences. This course was developed to provide experience and exposure to techniques and instrumentation for those students at the freshman and sophomore levels. Techniques include preparing solutions, pipetting, electrophoresis and manipulation of biological macromolecules. The aims of this course include: increasing student confidence and proficiency in biological laboratory skills that include safety considerations; preparation of students for skills necessary in future courses and/or careers; and preparation for assisting instructors at Chaminade University in laboratories and research projects. As a byproduct, you will be building *marketable* skills.

Course Objectives: The student is expected to demonstrate the following:

1. Ability to work safely in a biological laboratory. This requires 1) knowledge of the potential physical, chemical and biological hazards that can be encountered at CUH and in biological labs in general and 2) familiarity with the Chemical Hygiene Plan in place at CUH.
2. Working safely, cleanly and with consideration of other persons in the laboratory.
3. Proper operation and basic maintenance of instrumentation in a biological laboratory including autoclaves, balances, spectrophotometers, pipettes, centrifuges, balances, pH meters.
4. Basic techniques such as manipulation of microbes and macromolecules, pipetting, solution preparation, extracting protocols from publications, electrophoresis.
5. Participation in researching, designing and setting up a project with other individuals.
6. Proper and accurate laboratory procedure documentation as well as accurate analysis and reporting of data.

Grades will be based on the following criteria:

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| Assignments (9 total): | 180 points |
| Safety Quiz | 20 points |
| Class Project (reports* required) | 50 points |
| Notebook (2 checks @ 25 points) | 50 points |
| One practical midterm exam: | 50 points |
| Final exam | 100 points |

*Tentative Schedule of Topics (all labs on Monday):*

| Date | Topics | Assignments* |
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| August 26* | Course Introduction<br>Tour of Laboratories<br>Safety Videos (HH 17) | I. Careers in Biology<br>II. DAPI<br>III. Basic Math Functions |
| September 9 | Review Assignments<br>Chemical Hygiene Plan (HH 17)<br>Autoclaves/Distilling Water<br>Glass and Plastic Labware | ---Safety quiz next week!<br>IV. Retrieving/analyzing MSDSs |
| September 16 | Safety Quiz<br>Balances/stir plates<br>Documentation/Notebooks<br>Preparing Solutions I<br>Class Project discussion | V. Solutions |
| September 23 | Preparing Solutions II<br>Temperature/pH<br>Filtration<br>Measuring volume/pipetting<br>Biohazards in the Lab (HH 17) | VI. pH/pipetting worksheet<br>(due at end of lab) |
| September 30 | Spectrophotometry<br>Basic Statistics/Graphing<br>Prepare plates/media for next week | VII. Statistics Problem Set |
| October 7* | Microbiological Techniques<br>(plating, streaking, colony isolation)<br>Making dilutions and titering | Practical Lab exam next meeting<br>VIII. Titering bacterial cultures |
| October 21 | Practical Laboratory Exam | |
| October 28 | Macromolecules<br>Centrifuges<br>Plasmid DNA Isolation | |
| November 4 | Gel Electrophoresis<br>"Photodocumentation"<br>Restriction Enzyme Analysis | IX. DNA quantitation/analysis |
| November 18 | Wrap up Class Project | Class project report due next week. |
| November 25 | Field Trip—UH Transgenics Lab<br>UH Microscope Facility | |
| December 2 | FINAL EXAM (accumulative)<br>2:00 – 4:50 PM | |