**Course Syllabus for Biology 210-Biological Techniques**
**Fall 2001**
**Chaminade University of Honolulu**

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| **Meeting time & place:** | **Monday 2:00-4:50 PM Henry Hall 13** |
| **Textbook:** | *Basic Laboratory Methods for Biotechnology* **(Siedman & Moore)** |
| **Supplemental material:** | **Additional materials on safety, protocols, techniques and instruments will be distributed during the course of the semester.** |
| **Instructor:** | Dr. Joan Kuh |
| **Office & Contact Info:** | 16 **Henry Hall, 735-4807 (phone),** jkuh@chaminade.edu **(e-mail)** |
| **Office Hours:** | MWF **11-12, T Th 9:30-10:30 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 skills that includes 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.**

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

1. **Ability to work safely in a biological laboratory that requires knowledge of the potential physical, chemical and biological hazards that can be encountered at CUH and in biological labs in general.**
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 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. **Ability to carry out an experiment independently.**
6. **Participation in researching, designing and setting up a project with other individuals.**
7. **Proper laboratory notebook keeping as** well as **accurate analysis and reporting of data.**

**Grades will be based on the following criteria:**

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| **Assignments (4 @ 25 points each):** | **100 points** |
| **Individual project (report required)** | **50 points** |
| **Class Project (reports* required)** | **50 points** |
| **Notebook** | **50 points** |
| **Quizzes (5 @ 20 points each)** | **100 points** |
| **One practical midterm exam:** | **50 points** |
| **Final exam** | **100 points** |

# *Tentative (!!!) Schedule for BI 210. Fall 2001*

| *Week* | *Date* | *Assignments* |
|---|---|---|
| 1 | Aug 27 | 1. Introduction---review syllabus<br>2. Tour of Biology Lab Area<br>3. Safety Video followed by discussion (Chapters2 & 28)<br>4. Assignment 1---Careers in the Biological Sciences<br>5. Class Assignment description and homework |
| 2 | Sep 03 | Labor Day--No Class |
| 3 | Sep 10 | 1. Quiz on Safety<br>2. Chemical Hazards (Chapter 29) & Safety/ CUH Report<br>3. Documentation (Chapter 5-II)<br>4. Glass and Plastic Labware (Chapter 24-III)<br>5. Assignment I presentations<br>6. Class assignment discussion--begin to collect resources |
| 4 | Sep 1'] | I Measurement of weight/pH/temperature (Chapters 15, 17,18)<br>2. Lab Solutions A (Chapter 21)<br>3. Resources in biotechnology (publications/catalogs/books)<br>4. Distilled water, autoclave and stir plates (Chapter 24-II)<br>5. Basic math and making dilutions (Chapters 8 & 9) |
| | Sep 24 | 1. Quiz in Chemical Safety<br>2. Measurement of volume/pipetting (Chapter 16)<br>3. Biohazards (Chapter 30)<br>4. Lab solutions B (Chapter 22)<br>5. Class Assignment Progress---supplies/budget<br>6. Assignment II---making solutions for a Southern blot |
| | Oct 01 | 1. Quiz on biohazards and solutions<br>2. Preparation of media and plates<br>3. Relationships and graphing (Chapter 10)<br>4. Class project---submitting P.O.s |
| 7 | Oct 08 | Discoverer's Day --- no class |
| 8 | Oct 15 | 1- Filtration (Chapter 25)<br>2. Microbiological Techniques--plating, streaking, etc.<br>3. Data types and collection (Chapters 11,12)<br>4. Manipulation of Macromolecules (Chapter 23)<br>5. Class assignment progress report |

| *Week* | *Date* | *Assignments* |
|---|---|---|
| 9 | Oct 22 | **1. Quiz on data types and collection**<br>**2. Spectrophotometry (Chapters 19, 20)**<br>**2. Error in Data Collection (Chapter 13)**<br>**3. Setting up an experiment (Chapter 12, 13)**<br>**4. Growth Kinetics experiment** (handout)---Assignment **III**<br>**5. Set u class project** |
| 10 | Oct 29 | Midterm Practical Exam |
| 11 | Nov 05 | **1. Centrifuges (Chapter 26)**<br>**2. Genomic & Plasmid DNA Isolation (Chapter 23 / handout**<br>**3. Data presentation (Chapter** 32)---Assignment **4 statistics**<br>**4. Class project continued** |
| 12 | Nov 12 | veteran's Day --- No Class |
| 13 | Nov 19 | **1. Quiz on DNA isolation and statistics**<br>**2. Electrophoresis and Power Supplies (Chapters 14, 27)**<br>**3. Quantitation and assessment of DNA** isolations--Report 1<br>**4. Integrity in research**<br>**5. Class project continued** |
| 14 | Nov 26 | **1. Report 1 due on DNA isolation**<br>**2. Microscopy and staining/cytology**<br>**3. Class Project wrap-up** |
| 15 | Dec 03 | **1. Class project reports due**<br>**2. Field trip to research lab????** |
| 16 | Dec 10 | Final Exam 12:45-2:45 PM |

*Other activities that may be included along the way: Drosophila culturing, PCR, assessment of water quality (coliform counts), chromatography, ELISAs, non-radioactive Southern blots, hemacytometers, quality control of reagents (restriction enzymes and DNA markers).*