FD'02

BI 203L - Cellular and Organismic Biology Laboratory
Chaminade University of Honolulu
(BI 203L01-T 2-4:50, BI 203L02-Th 2-4:50,
BI 203L03-T 11-1:50, BI 202L04-Th 11-1:50)

Fall, 2002
R. Iwamoto &
L. Nagai
One Semester Credit

COURSE SYLLABUS AND OUTLINE

Text:

1. Wachtmeister, Hans F.E. & Larry J. Scott 2001 (6th ed.) *Encounters with Life: General Biology Laboratory Manual.* Morton Publishing, Englewood, CO.

2. Van De Graaff, Kent M. and John L. Crawley 2001 (4th ed.) *A Photographic Atlas for Biology Laboratory.* Morton Publishing, Engelwood, CO.

Course Description:

BI 203L is a 1 semester credit introductory biological science laboratory for those students enrolled in BI 203 - Cellular and Organismic Biology. This laboratory course is for students desiring advanced studies in the sciences, e.g., biology, forensic science, medicine, dentistry, environmental health, and other areas. It is followed by BI 204L in the second semester.

The following is from the 2001-2002 General Catalog:

> One three-hour laboratory period per week to accompany BI 203 and BI Laboratory work such as thin-layer chromatography and enzyme kinetics experiments.

Goals of the Course: This course is designed to fulfill the following goals:

1. To present principal methods and techniques coupled with appropriate instruments utilized in the study of cells and organisms;
2. To allow investigation and problem solving by manipulative and experimental methodology including preparation of written laboratory reports;
3. To examine applications of principles and concepts in lecture, such as the relationship between osmosis and kidney dialysis machines;
4. To work collaboratively in order to accomplish a common goal, i.e., lab experiment; and
5. To learn structure and function of cells, tissues, and organs by microscopic viewing, preserved specimens, and dissection.

Objectives for Students: At the completion of the course, the student will be able to do the following:

1. apply the Scientific Method to observable phenomenon;
2. identify specific biological equipment;
3. distinguish between quantitative and qualitative chemical tests;
4. identify biological specimens;
5. identify cellular and tissue types and structures;
6. identify different techniques;
7. identify parts of a scientific laboratory report;
8. understand and set-up a Chi-square genetics problem; and
9. develop an appreciation of working collaboratively in groups;

Laboratory preparation, outline, and attendance:

1. Preparation of laboratory assignments listed on the lab outline and presented in lab handouts are essential in successful completion of the laboratory and safety of your fellow students.
2. Handouts in the laboratory outline refer to assignments not in the lab manual. Lab handouts will be given to students prior to the laboratory exercise and include procedures and instructions for the laboratory.
3. Attendance for the laboratory is mandatory. Laboratory absences must be documented by valid excuses, such as a physician's excuse. Grade penalties will be imposed for unexcused absences by the instructor.

Laboratory notebook:

1. All students will be required to maintain a bound laboratory notebook into which **ALL** laboratory information and data is to be entered. Lab notebooks will be checked from time to time and graded.
2. The notebooks must be bound with non-tear out pages. Spiral notebooks are unacceptable, as are three-hole folder paper.
3. The format and grading of lab notebooks are given on a separate handout. Please follow the format including a table of contents with dates, exercise title, and page numbers.

Laboratory notebook cont'd...

4. Notebooks are due at the time of the lab exams. Notebooks that are one day late will be penalized by one grade level and no credit will be given for lateness beyond one day. This is the Biology Department policy on late notebooks and papers.

Laboratory Reports:

1. The format and grading of laboratory reports are included in a separate handout.
2. The procedures for the late lab reports is the same as in #4 above.

Grade Determination:

1. Separate grades will be given for lecture and laboratory. It is possible to receive different grades for lecture and laboratory.
2. The instructor does not curve grades or grade scores. Grades will be determined according to the scale used in lecture.
3. There will be two lab practical examinations with each consisting of station questions. Station questions are those questions in which the student has a specified period of time to identify the organism under a microscope, relate a function of a structure, explain a graph, or relate an objective to a exam and will include material completed **prior** to the exam; the second exam will include material covered since the midterm exam, it is not cumulative.
4. There will be both announced and unannounced quizzes. Makeup quizzes will **not** be given. Quizes will not be used to replace low exam grades.
5. Incomplete grades, early exams, and late exams are not given.
6. The laboratory grade will be determined in the following manner:

1st lab exam	100 points
2nd exam	100 points
Two lab reports @ 25 points each	50 points
Quizzes and Unknowns	50 points
Lab notebook @ 25 points each	50 points
Total	**350 points**

Class standing, office hours, and extra help:

1. Students may obtain their grades at any time by consulting with the instructor. Students with D or F grades will receive deficiency notices. It is mandatory that students receiving deficiency notices make an appointment to see the instructor.
2. Office hours are listed on the instructor's office door, Henry Hall Rm 16. The instructors are also available by appointment.
3. Tutoring services are available through the Chaminade University Learning Center. The Biology Department provides upper class students majoring in biology as tutors. Please contact the instructor regarding availability of tutoring services.

POLICIES, CLASS STANDING, OFFICE HOURS, AND EXTRA HELP:

1. Please consult the lecture syllabus as the same policies will be followed.

BIOLOGY 203L-CELLULAR & ORGANISMIC BIOLOGY LABORATORY *FALL 2001*
(BI 203L01-T & BI 203L02-Th 2-4:50 pm, *1 Semester*
BI 203L03-T & BI 203L04-Th 11-1:50 pm) *Credit*
CHAMINADE UNIVERSITY OF HONOLULU *ON CAMPUS*
HONOLULU, HAWAII 96816

COURSE OUTLINE-SUBJECT TO CHANGE

Bio.203L01, 203L02, (1 Crs) Cellular & Organismic Biology
203L03, 203L04 Laboratory R. Iwamoto/L. Nagai
Dept. No. (# Crs) Title Instructors

WEEK	DATE		ASSIGNMENTS	
1	AUG 27 T AUG 29 Th		Introduction: Syllabus & Course Outline; Lab Notebook & Lab Reports, Microscopy	Exercise 2 pp. 11-22 Handouts
2	SEPT 3 T 3 T 5 Th		Continue Microscopy & Scientific Method LAST DAY TO ADD/DROP CLASSES	Exercise 1 pp. 1-9 Exercise 2 pp. 11-22
3	SEPT 10 T 12 Th		Paiko Fringing Reef Ecosystem Field Trip: Identification of Fringing Reef Components & Measurement of Physical Factors-pH, temperature, and salinity	MICROSCOPE QUIZ Handouts
4	SEPT 17 T 19 Th		Qualitative Chemical Tests: Carbohydrates, Fats, & Proteins Identification of Unknown	Handouts Exercise 3 pp. 23-28
5	SEPT 24 T 26 Th		Quantitative Chemical Tests: Thin Layer Chromatography of Amino Acids; Standard Curve & Determination of Unknown Protein Concentration by Spectrophotometry & Serum Cholesterol Determination by Spectrophotometry	Handouts
6	OCT 1 T 3 Th		Factors Affecting Enzyme Kinetics: pH, temperature, [E] & [S] Lab Report Draft Due on 10/22 & 10/24, Final Report Due 11/5	Handouts LAB REPORT #1
7	OCT 8 T 10 Th		FIRST LAB EXAM AND LAB NOTEBOOKS DUE	

8	OCT	15 T 17 Th	Histology: Plant & Animal Tissues Microtome Demonstration, Histology laser disc pp. 29-34, Exercise 27 pp. 229-236, Exercise 20 pp. 155-165	Handouts Exercise 4
9	OCT	22 T 24 Th	Osmosis and Diffusion DRAFT OF ENZYME KINETICS REPORT DUE Osmosis Report Due 11/22	Handouts LAB REPORT #2 Exercise 5 pp. 35-40 Exercise 21 p. 165
10	OCT	29 T 31 Th	Mitosis and Meiosis	Handouts Exercise 9 pp. 61-70 QUIZ ON OSMOSIS
11	NOV	5 T 7 Th 8 F	Photosynthesis: Leaf Structure, Chromatography & Absorption Spectra ENZYME KINETICS REPORT DUE LAST DAY TO WITHDRAW WITHOUT GRADE PENALTY	Exercise 8 pp. 53-60
12	NOV	12 T 14 Th	Genetics: Chi-Square Tests of Monohybrid & Dihybrid Crosses	Exercise 10 pp. 71-82
13	NOV	19 T 21 Th	Human Inheritance: Human Karyotypes and slides, DNA extraction & Electrophoresis, Dr. Shimakawa & Dr. Kuh	Exercise 11 pp. 183-187 Handouts
14	NOV	26	Open Lab, Review for Lab Exam	
	NOV	28 & 29	THANKSGIVING RECESS, NO CLASSES	
15	DEC	3 T 5 Th	SECOND LAB EXAM AND LAB NOTEBOOKS DUE	

IMPORTANT DATES:

SEPT 3 LAST DAY TO ADD/DROP
NOV 8 LAST DAY TO WITHDRAW WITHOUT GRADE PENALTY

LABORATORY NOTEBOOK

Previous experiences have demonstrated that compilation of observations, data collection, calculations, and reporting of results is a problem for many scientists and students. To avoid repetition of previous difficulties, i.e., lost, uninterpretable, unrecorded ("he took it I didn't"), or dissolved by water or chemicals data, purchase a bound (non-spiral, non-tear out page) type of laboratory notebook. The following procedures are to be followed in your notebook.

1. All observations, data, calculations, laboratory notes, and lab related materials must be entered directly into the notebook. Neatness is not prerequisite, but it is a necessity that notes be legible to you.
2. An index or table of contents is required and includes the following: a) date of exercise, b) topic, and c) page numbers in the lab book.
3. Number the pages in your textbook if unnumbered. Uneven pages are used for field data or original observations, rough calculations, and unorganized summaries, answers to questions, and conclusions.
4. Drawings are mandatory with identification of structures and organism. Specific characteristics differentiating the specimen from others should be noted for later use, i.e., studying for identification questions on exams.
5. Since recopying of notes is discouraged, notebooks should be presentable with information completed to the current lab period. Notebooks will be examined without previous notice to determine progress.
6. Grading of notebooks is based on 1) organization-inclusion of all assigned works, table of contents, labeling and identification of structures and specimens in drawings, and completeness of data collected and 2) interpretation observations in exercises, completeness/correct answers to questions asked, conclusions drawn, and error analysis.

Hints:

1. Record everything and anything in the beginning. With time and experience you will learn what, how, and why to record information with your own shorthand that will allow greater freedom in recording and interpreting.
2. Immediately after obtaining data and completing observations, review and organize them. Remember that time is the ally of forgetfulness.
3. Use writing materials that is waterproof and streak proof.

Hints Cont'd...:

4. Do not depend on "the other person" to take your note, especially when working in group type experiments and exercises or field trips.
5. Lab hand-outs, review articles, supplemental information, and completed lab reports can be affixed to your notebook. References used should definitely be included with name(s) of authors(s), title, year, and volume/page numbers.
6. When the instructor presents information, especially at the beginning of the lab period, write copious notes. Often lab exam questions and significant information for successful completion of lab exercises are contained in the beginning briefing.

CHAMINADE UNIVERSITY WRITING STANDARDS

All work submitted by Chaminade University students must meet the following Writing Standards. Written assignments which fail to meet these standards will not be accepted by Chaminade University faculty unless alternative criteria have been specified by an instructor for a particular assignment.

(1) A paper must have a title page on which the writer gives the title, his or her name, the course title, and the date of submission. For short papers, it is usually adequate to provide this information on the first page of the paper.

(2) A paper must adhere to accepted manuscript format*.

a) It must be typed on white 8½" by 11" paper (except for in-class essays).
b) It must be double-spaced and typed on only one side of the paper.
c) It must have adequate margins on top, bottom, and sides.
d) References and/or footnotes must be used in accordance with standards specified by the instructor. In the absence of such specification, the writer should use standards given in English 102.

(3) A paper must adhere to conventional standards for written expression.

a) It should be free of errors in spelling, punctuation, capitalization and grammar.
b) The vocabulary and syntax should be appropriate to the assignment.
c) The writer should use proper sentence construction and coherent paragraphing.

*See the handbook of English recommended by the English Department for a complete list of manuscript requirements.

WRITING ASSISTANCE

The Chaminade Learning Center provides assistance for students in proofreading and correcting their written assignments. A writing clinic and tutorials are available to students at no cost to assist them in the mastery of basic writing skills. Typing instruction is available at several locations near Chaminade University and there are also lists of student typists available in the Learning Center.

FORMAT AND PROCEDURES FOR LABORATORY REPORTS

FORMAT:

1. Title: A title explains to the reader what the report contains. A title should not be so general that it does not specify what the experiment is, i.e., "osmosis." Neither should the title be so long that it tells everything, i.e., "Osmosis using dialysis bags containing 0.5M sucrose placed in isotonic, hypertonic, and hypotonic solutions with iodine added to determine porosity of the membrane." Be creative and imaginative to attract the interest of the reader. Do not use the title on the laboratory hand-out or from the laboratory text.

2. Abstract: An abstract is a brief, one-paragraph summary of the results of the experiment. Some investigators include short sentences on the purpose or objectives of the experiment. It precedes the introduction with single spacing, and is intended. Identify your abstract by placing the word, abstract, before the paragraph.

3. Introduction: This portion includes a full discussion of the objectives of the experiment. It also includes the biological concepts or principles on which the experiment is based and what is expected in the experiment. Some writers include a brief review of evidence from previous experiments or known information derived from previous testing.

4. Methods and Materials: Methods, techniques, equipment/supplies used are include in this portion. You may be brief by stating: "Please refer to the methods and materials as given in the lab hand-out or lab manual." You must include 10 a description of the control and why such a control was utilized and 2) explanations of deviations from original procedures.

5. Experimental Data: Consolidate your data into tables and graphs. Use the following format: 1) Table 1. "Title of Table." and 2) Fig. 1 "Title of Figure (graph). Units must be included. Calculations may be included in this section which precedes the discussion section.

FORMAT CONT'D...

6. Discussion: This portion discusses and explains the results of the research. It includes a comparison of the results to the theoretical principles and what was expected. Error analysis or plausible reasons for deviations must be included. Concentrate on errors of experimental design and instrumentation do not rely solely on technique errors, i.e., "the investigator titrated the wrong volume or did not obtain the correct weight." Answers to questions asked by experiment are included in this section, i.e., questions asked on hand-out sheets.

7. Conclusions: An optional portion in which the investigator assesses the experiment by listing in short sentences the results.

8. Literature Cited or Used: A part of the report comparable to a bibliography that cites the work of others used in the report. You must cute works of other even if direct quotes were not used or you are guilty of plagiarism. If direct quotes are used, follow standard English procedures. Be consistent with references, e.g. author's last name first, initials, year, title in quotes if journal or underlined if text, volume, page numbers, and publisher if text.

PROCEDURES:

1. Laboratory reports are separate reports that are not written into the laboratory notebook.
2. Typed or word processed reports are mandatory and hand written reports unacceptable.
3. Papers are due on dates listed in the laboratory outline. Laboratories requiring lab reports are listed in the laboratory outline.
4. **Late papers will be reduced by one grade for one day late and papers later than one day will be unacceptable with an F grade given.**
5. It is expected that correct English grammar and spelling are used in reports. Points may be deducted for incorrect usage of English grammar and spelling.
6. Two references, other than the laboratory hand-out, text, and lab manual is required and is usually used in the introduction section.
7. Length of typed papers are not to exceed 6 pages and are double-spaced use a font larger than 12pt. for the body of the report.
8. Grading of papers is based on use of proper format and procedures, organization, and interpretation.
9. On occasion that require that data from the entire laboratory section be pooled or used, it is the student's responsibility to obtain the results from other students or groups. It is useful to obtain this information during the lab period and not wait till the following day.

CHECKLIST FOR GRADING ESSAYS AND RESEARCH PAPERS
Biology 203/204

Student: _____ Points / Grade: _____

GOOD POINTS		NEEDS IMPROVEMENT	
Theme/ focus is clearly stated	_____	Needs clearer theme/focus	_____
Theme is well-developed	_____	Needs deeper analysis	_____
Specific examples are given	_____	Give more evidence	_____
Attempted interpretation	_____	Missing interpretation	_____
Well-structured/ organized	_____	Rethink organization	_____
Has a conclusion	_____	Lacks a conclusion	_____
Clearly written	_____	Needs more synthesis	_____
Well-documented	_____	Needs more sources	_____
Good command of topic	_____	Factual/concept errors	_____
Good synthesis skills	_____	Poor grammar	_____
Good use of references	_____	Multiple spelling errors	_____
Good presentation of data	_____	Poor subject/verb agreement	_____
		Report Format not followed	_____
		Poor presentation of data	_____
		Poor documentation	_____
		No data analysis	_____
		Recommend rewrite	_____

Additional comments:

_____ _____
Instructor Date