Bio. 203 Cellular & Organismic Biology
MWF 11-11:50 or TR *9:30-10:50*
3 semester credits
Chaminade University of Honolulu

Fall *1998*
August *31, 1998* to
December *17, 1998*
Instructor:
Ronald **M. Iwamoto**

COURSE OUTLINE AND SYLLABUS

IEXI:

McFadden, Carol H. and William T. Keeton *1995.*
Biology: An **Exploration of Life**. **W.W. Norton, N.Y. N.Y.**

COURSE DESCRIPTION:

Biology *203* is **a 3-credit introductory biological science course for those students desiring advanced studies in the sciences, e.g. biology, forensic science, medicine, dentistry, environmental health, and other areas.** *It is* **followed by Biology 204 in the second semester.**

The following is from the *1998-1999 General Catalog:*

> **Concepts of cellular and molecular biology stressed in** first **semester; second semester devoted to organisms stressing phylogenetic, ecological, and genetic relationships in plants and animals. Recommended for science majors.**

AIMS/GOALS OF THE COURSE: This course is designed to fulfill the following goals:

1. **To present the basic concepts and principles of biology for use in the present day and for future courses.**

2. **To prepare the student to continue into advanced biology or related fields, such as biochemistry.**

3. **To examine and analyze specific content areas, such as molecular or cellular biology, evolution, physiology, and related areas of biochemistry and biophysics. Cellular biology will be stressed during the** first **semester (Bi** 203) While **Organismal biology, based** on **organ systems, will be emphasized in the** second **semester (Bi** 204).

4. **To study the organisms included in the botanical and zoological fields emphasizing Hawaiian flora and fauna.**

5. **To impart an understanding of the accomplishments, failures, ambiguities, and the future of the biological sciences drawing on examples and applications of principles in the area of marine sciences, biomedical sciences and other disciplnes.**

OBJECTIVES FOR STUDENTS: At the completion of the course, the student will be able to do the following:

1. Analyze a scientific problem using principles and methods used in the natural sciences.

2. Use biological science terminology to communicate principles and concepts of biological content areas.

3. Provide examples and applications of principles and concepts of cells, systems, and living organisms.

4. Give examples of Hawaiian flora and fauna.

LECTURES:

1. Lectures are either 50 minutes duration, three times per week or one hour and twenty minutes duration, twice per week for approximately 15 weeks. Lectures are accompanied by a single laboratory period of 3 hours duration per week.

2. Text assignments and lecture topics are listed in the course outline. Consult the outline for assignments, announced quizes and exam dates, and holidays.

3. Supplemental readings may be assigned during the course of the semester.

4. Supplemental reference texts are on reserve in the library at the front desk and will include study guides with sample exam questions. These may be used for additional readings, references for lab reports, or for an alternative approach to your text. Please complete required assignments before using supplemental references.

5. Adjustments may be made to the lecture outline, such as changes in exam dates, or assignments due to conference trips.

GRADE DETERMINATION:

1. Separate grades will be given for lecture and laboratory. It is therefore, possible to receive different grades for lecture and laboratory.

2. Quizes, both announced and unannounced, will be given during the semester. At the end of the semester, the student may substitute the total quiz score average, based on 100%, for one of the lower scored lecture exams, not including the final exam.

GRADE DETERMINATION CONT'D...:

3. **Each student will submit 5 summaries of current events in biology. Each summary will be worth 10 points and instructions and requirements for the written summaries are given on a separate page. Summaries will be included as a portion of the lecture grade.**

4. **The lecture grade will be determined in the following manner.**

1st lecture exam	100 pts.	**Scale**
2nd lecture exam	100 pts.	A = **90%**
3rd lecture exam	100 pts.	B = 80%
5 summaries Q 10 pts.	50 pts.	C = **70%**
Two Hour Comprehensive Final Exam	150 pts.	D = 50%
		below 50%
	500 pts.	=F

5. **Lecture exams will include 10 extra credit points each, while the final exam will not include extra credit points. The final examination is a two hour comprehensive exam with 50% of the exam including questions repeated from the previous 3 lecture exams.**

6. **Any exam that the student fails to complete at the expected time can be made up only with a physician's excuse or valid reason to be determined by the instructor.**

POLICIES, CLASS STANDING OFFICE HOURS. AND EXTRA HELP:

1. **Attendance is mandatory for each lecture and laboratory. Attendance will be monitored as required for federal guidelines. Attendance for laboratory is especially important and unexcused absences for both lecture and laboratory will result in grade penalties to be determined by the instructor.**

2. **Quizes missed can not be made up, but excused absences will result in excused quizes.**

3. **Incompletes and early exams are not given. Extra credit work is not normally permitted.**

4. **Students may obtain their grades any time by consulting the instructor. Those with deficient grades will be notified prior to the withdrawl deadline of November 13, 1998. Students receiving deficiencies must consult with the instructor.**

5. **Peer tutoring is available. Please consult the instructor for tutoring from the Learning Center or upperdivision biology students.**

POLICIES, CLASS STANDING-OFFICE _. HOURS, AND_ EXTRA HELP CONT'D...

6. The instructor's office is in Henry Hall, Rm 16, phone 735-4808, fax (808) 739-4618, e-mail= RIwamoto@Chaminade.edu. The department secretaries phone is 735-4837. Office hours are posted on the door of the office. If you can not see me at office hours, please make an appointment or see me after lecture.

7. Please note that it is biology department policy to reduce grades by one grade level for late assignments within 24 hours of the deadline and a F grade is recorded for assignments later than 24 hours. This is for summaries, lab reports, and other assignments.

8. Those students with special needs, e.g., learning disabilities, should consult with the instructor during the first or second week of classes.

9. Academic dishonesty including cheating, plaigarism, and other serious offenses, such as giving answers to another student will not be tolerated. Appropriate action will be taken.

Bio. 203-Cellular & organismic Biology Mr. **R. Iwamoto**
Chaminade University of Honolulu

CELLULAR & ORGANISMIC BIOLOGY SUMMARIES

Cellular & Organismic Biology Summaries:

1. **The objectives of the summaries are threefold:**
   a. **To read and report on current topics in biology;**
   b. **To offer an alternative to quizes and examinations; and**
   c. **To participate in "writing across the curriculum," compositions in each area of the university curricula. This should help you develop the ability to research and write about selected topics.**

2. **There will be five, one to two paged summaries. Each summary will be worth 10 points and the total will be 50 points that are counted in the lecture grade.**

3. **The summaries must be from a 1998 publication of a newspaper, magazine, journal, or internet/web pages which must be pertinent to the biology field, e.g., not geology or chemistry.**

4. **Summaries are to be word processed or typed following university writing standards. The summary must include: author, title of article title of journal, magazine, or newspaper with titles of sources e.g, newspapers italicized or underlined; date of publication; page number(s). Please use the following for web site publications:**
   Author (if known). "Title" (main title if appicable). Last date updated or revised (if known. <URL> (date accessed).

5. **Please submit a xerox copy or internet/web page print out of the article with your summary. If you utilize National Geographic, Time, or Hawaii Fishing News articles, you need not xerox the article as the instructor has subscriptions to the above.**

6. **Due dates for summaries are listed on the course outline. Please submit summaries on time as there are penalties for lateness, reduction in one grade level for submission within 24 hours of the deadline and F for those after 24 hours of the deadline.**

7. **Examples of summaries are available for examination during the first weeks of classes.**

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.

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 ore 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.

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.

CHAMINADE UNIVERSITY OF HONOLULU *SESSION: FALL 1998*
Honolulu, Hawaii 96816 *On Campus*
COURSE OUTLINE-SUBJECT TO CHANGE

BIO 20302 (3 Crs) Cellular & Organismic Biology Mr. R. Iwamoto
Dept. No. #Crs. Title Instructor

WEEK	DATE		ASSIGNMENTS	
	AUG	31 M	Introduction: Syllabus & Course Outline	Chapt. 1 pp. 1-27
1	SEPT	2 W	Scientific Method, Characteristics of Life & Evolution	
		4 F	Spiritual Convocation at Mystical Rose Chapel 11-12 noon	
	SEPT	7 M	LABOR DAY HOLIDAY, NO CLASSES	
		8 T	LAST DAY TO ADD/DROP CLASSES	
2		9 W	Continue Scientific Method...	Chapt. 2 pp. 29-50
		11 F	Chemical Structure/Function: Atoms, Chemical Bonds, Water	QUIZ
	SEPT	14 M	Chemical Structure/Function: Organic Compounds & Carbohydrates	Chapt. 3 pp. 51-76
3		16 W	Chemical Structure/Function: Lipids and Proteins	SUMMARY 1 DUE
		18 F	Chemical Structure/Function: Nucleic Acids	
	SEPT	21 M	Chemical Reactions & Enzymes- Structure & Kinetics	Chapt. 4 pp. 77-88
4		23 W	Microscopy & Cell Theory	Chapt. 5 pp. 89-112
		25	FIRST LECTURE EXAM	
	SEPT	28 M	Cell Structure: Cell Membrane, Cell Wall, & Cell Connections	Chapt. 6 pp. 113-138
5		30 W	Cell Structure: Organells & Cytoskeleton	Chapt. 15 pp. 307-322
	OCT	2 F	Histology: Plant & Animal Tissues	SUMMARY 2 DUE

	OCT	5	M	Metabolism: Anaerobic Glycolysis	Chapt. 8 pp.161-178
6		7	W	Metabolism: Aerobic Respiration-Krebs Cycle	
		9	F	Metabolism: Fat & Protein Cycles	QUIZ
	OCT	12	M	DISCOVERER'S DAY HOLIDAY, NO CLASSES	
7		14	W	Photosynthesis	Chapt. 7 pp.139-160
		16	F	Photosynthesis	
	OCT	19	M	SECOND LECTURE EXAM	
8		21	W	Gene Structure/Function: DNA	Chapt. 10 pp. 203-214
		23	F	Gene Structure/Function: DNA	SUMMARY 3 DUE
	OCT	26	M	Gene Function: Transcription & Translation	Chapt. 11 pp. 215-232
9		28	W	Mobile Genes: Plasmids & Viruses	Chapt. 13 pp. 257-276
		30	F	Genetic Engineering & Cloning	QUIZ
	NOV	2	M	Gene Control: Induction, Operon, & Repression	Chapt. 12 pp. 233-256
10		4	W	Genes Out of Control: Cancer	SUMMARY 4 DUE
		6	F	Cell Reproduction: Mitosis	Chapt. 9 pp.179-202
	NOV	9	M	Cell Reproduction: Meiosis	
11		11	W	VETERAN'S DAY HOLIDAY, NO CLASSES	
		13	F	THIRD LECTURE EXAM LAST DAY TO WITHDRAW WITHOUT GRADE PENALTY	

	NOV	16	M	Embryology	Chapt. 27 pp.557-586
12		18	W	Embryology	
		20	F	Inheritance: Mendelian & Classical Genetics	Chapt. 14 pp. 277-306
	NOV	23	M	Assigned Work Due to New York National Minority Research Conference Attendance	SUMMARY 5 DUE
13		24	W	Assigned Work	Chapt. 31 pp.669-702
		25	TH & F	THANKSGIVING RECESS, NO CLASSES	
	NOV	30	M	Evolution	
14	DEC	2	W	Evolution	
			F	Phylogeny	Chapt. 32 pp.703-736
	DEC	7	M	Phylogeny	
15		9	W	Review	
		11	F	Review	

16 DECEMBER 16, 1998, WEDNESDAY, 10:30 AM-12:30 PM, TWO-HOUR COMPREHENSIVE FINAL EXAMINATION

IMPORTANT DATES: *SEPT 8 LAST DAY TO REGISTER, ADD/DROP CLASSES*

NOV 13 LAST DAY TO WITHDRAW FROM CLASSES

DEC 14 BEGIN FINAL EXAM WEEK

Bio. 203L-Cellular & organismic Biology Laboratory **Fall 1998**
T 11-1:50 or Th 2-4:50, one semester credit **August 31, 1998 to**
Chaminade University of Honolulu
Instructor: Ronald M. Iwamoto **December 17, 1998**

COURSE OUTLINE AND SYLLABUS

TEXT:

Keeton, William T., Michael W. Dabney, and Mary Philpott 1986 Biological Investigations in the Laboratory. W.W. Norton & Company, N.Y., N.Y.

COURSE DESCRIPTION: **The course description is from the 1998-1999** *General Catalog.*

> **One three-hour laboratory period per week to accompany BI 203 and BI 204. Laboratory work such as thin layer chromatography and enzyme kinetics experiments. Offered annually.**

LABORATORY AIMS/GOALS: The **laboratory is designed to fulfill the following goals.**

To **present principal methods or techniques using appropriate instruments utilized in the study of cells and organisms.**

2. **To allow investigation and problem solving by manipulative and experimental methodology including preparation and completion of laboratory reports.**

3. To **examine applications of principles and concepts presented in lecture, such as the relationship between osmosis and kidney dialysis.**

4. To **observe and identify plants and animals, living and preserved, of both Hawaiian and introduced species.**

S. To learn **structure and function of cells, tissues, organs, and systems by microscopy, preserved and live specimens, experimentation, and dissection.**

OBJECTIVES FOR STUDENTS: **At the completion of the course, the student will be able to do the following.**

Explain techniques of a particular experiment and use instruments, such as a microscope, balance, spectrophotometer, pH **meter, and Winkler bottles.**

2. **Explain applications of biological principles discussed in** *situ* **field trips and in the laboratory, such as adaptations of coastal plants or amniocentesis.**

OBJECTIVES FOR STUDENTS CONT'D...

3. **Identify and discuss plants and animals, microscopic** and macroscopic **structure/function.**

4. **Design, complete, interpret, and report experimental data from an experiment in a written scientific report in a format suitable for presentation and submission to a biological journal.**

LABORATORY PREPARATION, **OUTLINE, AND ATTENDANCE:**

1. **Preparation of laboratory assignments listed on the lab outline and presented in lab hand-outs are essential in successful completion of the laboratory.**

2. **Hand-outs in the laboratory outline refer to assignments not in the lab manual. Lab hand-outs 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.**

GRADE DETERMINATION:

1. A **separate grade is given for laboratory.**

2. **Laboratory grades will be determined in the following manner with the same scale used for lecture.**

Laboratory Exam 1	**100** pts.
Laboratory Exam 2	100 pts.
Laboratory Notebook (graded twice)	50 pts.
Two Laboratory Reports @ 25 pts.	50 pts.
Quizes and unknowns	**50 pts.**
	350 pts.

3. **Laboratory exams are station exams with students moving from station to station** answering **questions at each station in a specified time period. Each laboratory exam** contains **10 extra credit points.** The second **lab exam is not comprehensive and includes material covered since the** first **lab exam.**

4. **Laboratory quizes will be announced and unannounced with the same policies for lecture except that quizes will not be used to replace low exam scores.**

LABORATORY NOTEBOOK:

1. Each student will be required to maintain a bound laboratory notebook into which all laboratory information and data is to be directly entered. Lab notebooks will be periodically checked and graded. Lab notebooks will be submitted at the time of laboratory exams.

2. The notebook should be bound with non-tear out pages. Spiral bound notebooks are unacceptable.

3. The format and grading of lab notebooks are given on a separate hand-out. Please follow the format including a table of contents with topic, date, and page numbers.

LABORATORY REPORTS:

1. The format and components of a laboratory report are included in a separate hand-out. Sample reports will be available for examination.

2. Both lab notebooks and lab reports that are late will be penalized by one grade level. Lab notebooks and lab reports later than 24 hours will receive F grades.

POLICIES, CLASS STANDING, OFFICE HOURS AND EXTRA HELP:

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

Bio. 203-204L-Cellular & Organismic Biology Mr. R. Iwamoto

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 a 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 notebook if unnumbered. Uneven numbered pages are used for field data or original observations, rough calculations, and unorganized materials. liven numbered pages are used for organized 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) interpretations-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 material that is waterproof and streak proof.

4. Do not depend on "the other person" to take your notes, 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 afixed to your notebook. References used should definitely be included with name(s) of author(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.

Bio. 203L-204L-Cellular & Organismic Biology Lab Mr. R. Iwamoto

FORMAT AND PRO=5 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 1.5M 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 purposes or objectives of the experiment. It precedes the introduction with single spacing, and is indented. 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 included 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 1) a description of the control and why such a control was utilized and 2) explanations of deviations from the expected 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.

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 and 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 the experiment are included in this section, i.e., questions asked on hand-out sheets.

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

8. Literature Cited or Used& A part of the report comparable to a bibliography 94t cites works of others used in the report. You must cite works of others even if direct quotes were not used or you are guilty of plagarism. 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.

Bio. 203-204L:Cellular **& organismic Biology Lab**

FORMAT AND PROCEDURES FOR LABORATORY REPORTS CONT'D...

1. **Laboratory reports are separate papers** that **are not written into the laboratory notebook.**

2. **Word processed or typed reports are mandatory.**

3. **Reports are due on dates listed in the laboratory outline and those laboratories requiring reports are so indicated in the laboratory outline.**

4. **Two references, <u>other than the laboratory manual, hand-out, or text</u>, are required and are usually used in the introduction section.**

5. **It is expected that correct English grammar, spelling, and syntax be used in reports. Points will be deducted for incorrect usage of English.**

6. **Length of papers is not to exceed 6 pages double spaced with the exception of the abstract and does not include a reference and title page.**

7. **On occasions** that require that **data from the entire** laboratory **section be pooled or used, it is the student's responsibility to obtain the results. <u>Obtain the results</u>** during **<u>the laboratory period and do not wait till the following day or next laboratory</u>.**

8. **Written policies in the syllabus on lateness will be followed. Late papers within 24 hours will be reduced one grade level and papers later than 24 hours will receive F grades.**

BIOLOGY 203L-CELLULAR & ORGANISMIC BIOLOGY LABORATORY *FALL 1998*
CHAMINADE UNIVERSITY OF HONOLULU *ON CAMPUS*
HONOLULU, HAWAII 96816

COURSE OUTLINE-SUBJECT TO CHANGE

Bio.203L01 & 203L02 (1 Crs) Cellular & Organismic Biology Laboratory Mr. R. Iwamoto
Dept. No. (# Crs) Title Instructor

WEEK	DATE	ASSIGNMENTS	
1	SEPT 1 T 3 Th	Introduction: Syllabus & Course Outline; Lab Notebook & Lab Reports	
2	SEPT 8 T 10 Th	Microscopy Scientific Method & Measurement Procaryotic & Eucaryotic Cells	Topic 1 pp. 1-14 Hand-outs Topic 2 pp. 15-19
3	SEPT 15 T 17 Th	Qualitative Chemical Tests: Carbohydrates, Fats, & Proteins Identification of Unknown	Hand-outs MICROSCOPE QUIZ
4	SEPT 22 T 24 Th	Paiko Fringing Reef Ecosystem Field Trip: Identification of Fringing Reef Components & Measurement of Physical Factors- pH, temperature, & salinity	Hand-outs
5	SEPT 29 T OCT 1 Th	Quantitative Chemical Tests: Thin Layer Chromatography of Amino Acids; Standard Curve & Determination of Unknown Protein Concentration by Spectrophotometry & Serum Cholesterol Determination by Spectrophotometry	Hand-outs
6	OCT 6 T 8 Th	Factors Affecting Enzyme Kinetics: pH, temperature, [E] & [S] Lab Report Draft Due on 10/27 & 10/29	Hand-outs LAB REPORT
7	OCT 13 T 15 Th	FIRST LAB EXAM AND LAB NOTEBOOKS DUE	
8	OCT 20 T 22 Th	Histology: Plant & Animal Tissues Microtome Demonstration Gram Staining of Bacteria	Hand-outs

	OCT	*27 T*	Osmosis and Diffusion		Hand-outs LAB REPORT
9			DRAFT OF ENZYME KINETICS REPORT DUE		
		29 Th	Osmosis Report Due *11/17 & 11/19*		
	NOV	3 T	Photosynthesis: Leaf Structure;		Topic 4
10			Paper Chromatography of Plant		pp. 27-
		5 Th	Pigments & Absorption Spectra		38 QUIZ ON OSMOSIS
	NOV	10 T	Mitosis and Meiosis		Topic 16
			ENZYME KINETICS REPORT DUE		pp. 157-165
11		13 Th	LAST DAY TO WITHDRAW WITHOUT GRADE		PENALTY
	NOV	17 T	Genetics: Chi-Square Tests of		Topic 17
12			Monohybrid & Dihybrid Crosses		pp. 166-182
		19 Th			
	NOV	24 T	No labs, Thanksgiving Recess Week		
13		26 Th			
	DEC	1 T	Human Inheritance: Human Karyotypes		Topic 18
14			and slides		pp. 183-
		3 Th	OSMOSIS LAB REPORTS DUE		*187*
	DEC	8 T	SECOND LAB EXAM AND LAB NOTEBOOKS DUE		
15		10 Th			

IMPORTANT DATES: *SEPT 8 LAST DAY TO ADD/DROP*

NOV 13 LAST DAY TO WITHDRAW WITHOUT GRADE PENALTY