Bio. 203L-Cellular & Organismic Biology Laboratory — Fall 1999
T 11-1:50,T 2-4:50 & Th 2-4:50, one semester credit — August 30,
Chaminade University of Honolulu — 1999 to
Instructors: Ronald M. Iwamoto & — December
Patricia Lee-Robinson — 15, 1999

COURSE OUTLINE *AND* SYLLABUS

TEXT

Keeton, William T., Michael W. Dabney, and Mary Philpott 1986 W.W. Norton & Company, N.Y., N.Y.

COURSE DESCRIPTION:

Biology 203L is a 1 semester credit introductory biological science laboratory for those students enrolled in Biology 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 Biology 204L in the second semester.

The following is from the 1999-2000 *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.

LABORATORY AIMS/GOALS:

The laboratory is designed to fulfill the following goals.

1. 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.
5. To learn structure and function of cells, tissues, organs, and systems by microscopy, preserved and live specimens, experimentation, and dissection.

At the completion of the course, the student will be able to do the following.

1. 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.

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 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.

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

		Scale
Laboratory Exam 1	100 pts.	A = 90%
Laboratory Exam 2	100 pts.	B = 80%
Laboratory Notebook (graded twice)	50 pts.	C = 70%
Two Laboratory Reports @ 25 pts.	50 pts.	D = 50%
Quizes and unknowns	50 pts.	below 50% = F
	350 points	

GRADE DETERMINATION CONT'D.

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 cumulative and includes material covered since the first lab exam.**

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 must 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 handout. 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 handout. 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 job 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. Even 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 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 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 an the laboratory hand-out or from the laboratory text.

2. Abstracts 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.

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 of 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. Discussions 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 that 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 consister 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, other than the laboratory manual, hand-out, or text, 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. Obtain the result during the laboratory period and do not wait till the following day or next laboratory.**

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 1999
CHAMINADE UNIVERSITY OF HONOLULU ON CAMPUS
HONOLULU, HAWAII 96816

COURSE OUTLINE-SUBJECT TO CHANGE

Bio.203L01 & (1 Crs) Cellular & Organismic Biology
203L02 & 203L03 Laboratory R. Iwamoto/P.Lee-Robinson
Dept. No. (# Crs) Title Instructors

WEEK	DATE	ASSIGNMENTS	
1	AUG 31 T SEPT 2 Th	Introduction: Syllabus & Course Outline; Lab Notebook & Lab Reports, Microscopy	Topic 1 pp. 1-14
2	SEPT 7 T 7 T 9 Th	Continue Microscopy & Scientific Method LAST DAY TO ADD/DROP CLASSES Procaryotic & Eucaryotic Cells	Topic 1 pp. 1-14 Handouts Topic 2 pp. 15-19
3	SEPT 14 T 16 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 21 T 23 Th	Qualitative Chemical Tests: Carbohydrates, Fats, & Proteins Identification of Unknown	Handouts
5	SEPT 28 T 30 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 5 T 7 Th	Factors Affecting Enzyme Kinetics: pH, temperature, [E] & [S] Lab Report Draft Due on 10/26 & 10/28	Handouts LAB REPORT #1
7	OCT 12 T 14 Th	FIRST LAB EXAM AND LAB NOTEBOOKS DUE	
8	OCT 19 T 21 Th	Histology: Plant & Animal Tissues Microtome Demonstration, Histology laser disc, Gram Staining of Bacteria	Handouts

FD99

RM

Bic. 203-Cellular & Organismic Biology
MWF 9:00-9:50 or TR 9:30-10:50
3 semester credits
Chaminade University of Honolulu

Fall *1999*
August *30, 1999 to*
December *15, 1999*
Instructors:
Ronald M. Iwamoto
Patricia Lee-Robinson

COURSE OUTLINE AND SYLLABUS

TEXT:

Gould, James L. and William T. Keeton 1996. (6th ed.)
Biological Science. W.W. Norton & Company, 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. Offered annually. Recommended: one year each of high school biology and chemistry. *Concurrent registration in BI 203L-BI 204L required.***

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

To present the basic concepts and principles of biology for use in the 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, 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 he 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.

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 @ 10 pts.	50 pts.	C = 70%
Two Pour 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 cumulative 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 written 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. 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. In cases of excused absences, quizes will not be counted.

POLICIES **CLASS** STANDING, **OFFICE** HOURS AND EXTRA HELP CONT'D

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 withdrawal deadline of November 12, 1999. 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.**

6. **The instructors' office is in Henry Hall, Rm 16, phone with Iwamoto's phone 735-4808, fax (808) 739-4618, e-mail=** Riwamoto@chaminade.edu **and with Lee-Robinson's phone 735-4804, fax (808) 739-4618 e-mail =** leerobin@ hawaii.edu. Office **hours are posted on the door of the office. If you can not see us at office hours, please make an appointment or see us 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.** An 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, plagiarism, and other serious offenses, such as allowing another student to copy a paper, will not be tolerated. Appropriate action will be taken.**

Bio. 203/204-Cellular & Organismic *Biology* *Mr. R. Iwamoto*
Chaminade University of Honolulu

CELLULAR & ORGANISMIC *BIOLOGY SUMMARIES*

Cel u a & Organismi 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 .unted in the lectur. grade.

3. The summaries must be from a 1999 publication of a newspaper, magazine, journal, or internet/web pages which must be pertinent o 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
   w
   lication: page number(s). Please use the following for web site publications from the APA format:
   Author, I. (Date). Title of Article. Name of Pe 1
   (Online), XX. Available: Specify path (<URL>date accessed).

   Example:Mestel, R. (March 1999). Drugs from the Sea. Discover, Vol. 20 No. 3. Available: http://www.discover.com 99/drugs.html, Date accessed 3/8/99.

5. Please submit a xerox copy or internet/web page print out of the article with your summary. If you utilize National Graphic or Tim articles, you need not xerox the article as the instructors have 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 ho
   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

Ail work submitted *by* Chaminade Universit *students rust* meet *the* following Writing Standards. *Written* assignments which WT to meet these standards will *not be* accepted *by* Chaminade *University faculty unless alternative criteria nave* been specified *by an* instructor *for a particular* assignment.

(1) A paper must hive 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 pro.* vide *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.

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

a) It should *be* free *of* errors in spelling, punctuation, capitalization and grump.

b) The vocabulary and syntax should be appropriate to the assignment.

e) The writer should use proper sentence construction and coherent paragraphs nit

*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 ate! 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
Honolulu, Hawaii 96816

SESSION: FALL 1999
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	30	M	Introduction: Syllabus & Course Outline	Chapt. 1 pp. 1-19
1	SEPT	1	W	Scientific Method, Characteristics of Life & Evolution	
		3	F	Continue Scientific Method	
	SEPT	6	M	LABOR DAY HOLIDAY, NO CLASSES	
		7	T	LAST DAY TO ADD/DROP CLASSES	QUIZ
2		8	W	Continue Evolution	Chapt. 2 pp. 20-45
		10	F	Chemical Structure/Function: Atoms, Chemical Bonds, Water	
	SEPT	13	M	Chemical Structure/Function: Organic Compounds & Carbohydrates	Chapt. 3 pp. 46-83
3		15	W	Chemical Structure/Function: Lipids and Proteins	**SUMMARY** 1 **DUE**
		17	F	Chemical Structure/Function: Nucleic Acids	
	SEPT	20	M	Chemical Reactions & Enzymes-Structure & Kinetics	Chapt. 4 pp. 84-119
4		22	W	Microscopy & Cell Theory	
		24	F	FIRST LECTURE EXAM including 9/20/99	
	SEPT	27	M	Cell Structure: Cell Membrane, Cell Wall, & Cell Connections	Chapt. 5 pp. 120-151
5		29	W	Cell Structure: Organelles & Cytoskeleton	
	OCT	1	F	Histology: Plant & Animal Tissues	**SUMMARY** 2

	OCT	4	M	Metabolism: Anaerobic Glycolysis	Chapt. 6 pp. 152-177
6		6	W	**Metabolism: Aerobic Respiration-Krebs** Cycle	
		8	F	**Metabolism: Fat & Protein Cycles**	**QUIZ**
	OCT	**11**	**M**	**DISCOVERER'S DAY HOLIDAY, NO CLASSES**	
7		13	W	**Photosynthesis**	**Chapt. 7 pp. 178-203**
		15	F	**Photosynthesis**	
	OCT	**18**	**M**	**SECOND LECTURE EXAM including 10/15/99**	
8		**20**	**W**	**Gene Structure/Function: DNA**	**Chapt. 8 pp. 204-223**
		22	**F**	**Gene Structure/Function: DNA**	**SUMMARY 3 DUE**
	OCT	**25**	**M**	**Gene Function: Transcription & Translation**	**Chapt. 9 pp. 224-245**
9		**27**	**W**	**Mobile Genes: Plasmids & Viruses**	**Chapt. 10 pp. 246-271**
		29	**F**	**Genetic Engineering & Cloning**	**QUIZ**
	NOV	1	M	**Gene Control: Induction, Operon, & Repression**	**Chapt. 11 pp. 272-307**
10		3	**W**	**Genes Out of Control: Cancer**	**SUMMARY 4 DUE**
		5	**F**	**Cell Reproduction: Mitosis**	**Chapt. 12 pp. 308-335**
	NOV	8	M	**Cell Reproduction: Meiosis**	
11		**10**	**W**	**Assigned Work Due to Instructor's Attendance With Students at the National Minority Research Symposium, Phoenix, Arizona**	
		12	**F**	**Assigned Work Due to Conference**	

LAST DAY TO **WITHDRAW WITHOUT GRADE PENALTY**

	NOV	15	M	Embryology	Chapt. 13 pp. 336-355
12		17	W	THIRD **LECTURE EXAM** including 11/8/99	
		19	F	Embryology	Chapt. 14 pp. 356-377
	NOV	22	M	Inheritance: Mendelian & Classical Genetics	**Summary** 5 DUE, Chapt. 16 pp. 406-443
13		24	W	Inheritance Cont'd...	Chapt. 17 pp. 445-486
				25-26 Th & F **THANKSGIVING RECESS,** *NO* CLASSES	
	NOV	29	M	Evolution	
14	DEC	1	W	Evolution	QUIZ
		3	F	Phylogeny	Chapt. 18 pp. 487-528
	DEC	6	M	Phylogeny	
15		8	W	Review	
		10	F	Review	

16 DECEMBER 13, 1999, Monday, 10:30 AM-12:30 PM, TWO-HOUR **CUMULATIVE** FINAL EXAMINATION

IMPORTANT DATES: *SEPT 7 LAST DAY TO REGISTER, ADD/DROP CLASSES*

NOV 12 LAST DAY TO WITHDRAW FROM CLASSES

DEC 13 BEGIN FINAL EXAM WEEK