

GENERAL GENETICS - BIOLOGY 340

Fall Quarter 2011

Dr. Margaret Jefferson, Dr. Barbara Veno & Mr. Dwight Beltz

LECTURES: TTH 1:30-2:45 PM – SH C343 CLASS # 10216 – 01

LABS: T 10:30 AM-1:00 PM – ASC-LK 243 CLASS # 10217 – 02 or

T 3:00 PM-5:30 PM – ASC-LK 243 CLASS # 10218 – 03 or

TH 10:30 AM-1:00 PM – ASC-LK 243 CLASS # 10219 – 04 or

TH 3:00 PM-5:30 PM – ASC-LK 243 CLASS # 10220 – 05

1. **COURSE DESCRIPTION:**

This course will focus on the integration of molecular genetics with classical transmission genetics. The course examines the transmission, mutation, and function of genetic material. These processes are manifested at the molecular level and can be studied using such techniques as DNA electrophoresis and they are manifested at the organismic level through their association with visible traits. We will cover as many chapters as time permits. Items labeled **REVIEW** contain some material that is covered in BIOL 100B so you are EXPECTED to have been introduced already to some of this material and have some degree of understanding. Be prepared to ask questions if there are things you do not understand. This 4-unit course fulfills one of the five required core courses for Biology majors.

2. **LECTURE TOPICS:**

CHAPTER #:

a. REVIEW: The Genetic Code of Genes and Genomes	1
b. REVIEW: Transmission Genetics: Heritage from Mendel	2
c. REVIEW: The Chromosomal Basis of Heredity	3
d. Gene Linkage and Genetic Mapping	4
e. Human Chromosomes and Chromosome Behavior	5
f. REVIEW: DNA Structure, Replication, and Manipulation	6
g. REVIEW: The Genetics of Bacteria and Their Viruses	7
h. The Molecular Genetics of Gene Expression	8
i. Molecular Mechanisms of Gene Regulation	9
j. Genomics, Proteomics, and Genetic Engineering	10
k. The Genetic Control of Development	11
l. Molecular Mechanisms of Mutation and DNA Repair	12
m. Molecular Genetics of the Cell Cycle and Cancer	13
n. Molecular Evolution and Population Genetics	14
o. The Genetic Basis of Complex Inheritance	15

3. **TEXTBOOK:** *Essential Genetics – A Genomics Perspective*, 5th edition, Daniel L. Hartl, 2011; ISBN 9780763773649
General Genetics Laboratory, 3rd edition, Margaret C. Jefferson, 2004
Software packages = *FlyLab* and *PedigreeLab* licenses for home use

4. **DR. JEFFERSON'S OFFICE AND PHONES:**

Office Building / Room: ASC-B / 323B
Office Phone # [323]343-2059
Biology Phone # [323]343-2050
Fax # [323]343-6451

DR. JEFFERSON'S OFFICE HOURS:

MONDAYS 10:00 AM – 1:00 PM
TUESDAYS 12:00 PM – 1:00 PM
WEDNESDAYS 10:00 AM – 12:00 noon; 3:30 PM – 5:00 PM
E-mail address: mjeffer@calstatela.edu

5. **DR. VENO'S OFFICE AND PHONES:**

Office Building / Room: ASC-LK / 317
Office Phone # [323]343-2018
Biology Phone # [323]343-2050

DR. VENO'S OFFICE HOURS:

TUESDAYS 11:20 AM – 12:00 PM
THURSDAYS 11:20 AM – 12:00 PM
E-mail address: bveno@calstatela.edu

6. **MR. BELTZ'S OFFICE AND PHONES:**

Office Building / Room: ASC-B / 356
Office Phone # [323]343-5555
Biology Phone # [323]343-2050

MR. BELTZ'S OFFICE HOURS:

TUESDAYS 5:00 PM – 5:40 PM
THURSDAYS 5:00 PM – 5:40 PM
E-mail address: dbeltz@cslanet.calstatela.edu

7. **COURSE PREREQUISITES:** Completion of the BIOL 300 or equivalent course.
8. **BLACKBOARD AND COURSE HOMEPAGE:**
Blackboard Learning System is a leading provider of electronic-learning systems for educational institutions. All lecture outlines, handouts, additional problems for some chapters, and access to classroom performance and current grades will be available to students as soon as they **PROPERLY** establish the Blackboard account for access to the course homepage. It is your responsibility to print out the any materials on the course homepage for use in class. Only one copy of the course syllabus will be provided to you at the **first** class meeting. All other course materials must be obtained from Blackboard Learning System (formerly known as WebCT). You will need to have a functional NIS account that corresponds to the way your name appears on the class roster. If you have changed your name or if you are a new CSULA student who does not have a NIS account, you will need to visit the ITS Help Desk in Library South (Palmer Wing) entrance Only students who are officially registered for the course will have access to the course homepage after September 30. You must have your Blackboard account properly set up before the end of September.
9. **PROBLEM SOLVING QUIZZES/ACTIVITIES:**
There will be two 30-minute problem solving quizzes/activities given during lecture time. There are **NO MAKE-UP** opportunities if you are not in this class on the dates they are given. If you miss class on a day that the problem solving quiz/activity is given, you will receive **ZERO** points for that quiz/activity. Please note that these quizzes are open book and notes, and if you want, you may work very quietly with others on the quizzes **ONLY** but remember, if you do not know what you are doing and if you rely too heavily on someone else's thinking and problem-solving ability, it becomes very evident when you take the midterms, which are done individually with no materials at your desks.
10. **FORMAT FOR QUIZZES/ACTIVITIES, MIDTERMS AND FINAL EXAM:**
Questions will consist of a variety of formats but primarily **problems** and short answer questions. Midterm I covers the first half of the class and Midterm II covers the second half. The final exam is comprehensive since basic principles underline more complex principles. Work as many problems as you can on a **WEEKLY BASIS**, attend lectures and participate in the learning process, read the text, and **learn the terminology**. Ask questions, seek help when you encounter difficulties, and keep up with the material. Students who struggle in this course are usually students who have fallen behind and not understood the basics. **There are no make-ups if you miss a class!**
11. **IMPORTANT LECTURE DATES:**
- Problem Solving Quiz 1 Tuesday, October 11, 2011 – 30 minutes
 - Midterm I Thursday, October 20, 2011 for entire lecture period
 - Problem Solving Quiz 2 Tuesday, November 8, 2011 – 30 minutes
 - Midterm II Tuesday, November 22, 2011 for entire lecture period
 - Final Exam Tuesday, December 6, 2011 from 1:30 PM – 4:00 PM
12. **GRADE REQUIREMENTS:**
- Problem Solving Quizzes/Activities (2 @ 75 pts. each) = 150
 - Lecture Midterms (2 @ 175 pts. each) = 350
 - Lecture Final Exam = 250
 - Lab Reports (7 @ 25 pts. each) + Lab Notebook (25 pts.) = 200
 - Lab Final Exam = 50
 - TOTAL POINTS = 1,000
 - Points Deducted for each lab absence or lab late arrival= -5 for EACH event

13. **GRADING FORMAT:** *only the following grades will be awarded based solely on total points indicated below*
- To receive an A: 920 points or more
 - To receive an A-: 900 - 919 pts.
 - To receive a B+: 880 - 899 pts.
 - To receive a B: 820 - 879 pts.
 - To receive a B-: 800 - 819 pts.
 - To receive a C+: 780 - 799 pts.
 - To receive a C: 650 - 779 pts.
 - To receive a D: 500 - 649 pts.
 - To receive an F: less than 500 pts.
14. **UNIVERSITY INCOMPLETE GRADE POLICY:**
In the 2011-2012 University Catalog under Procedures and Regulations, the following wording is associated with the assignment of an incomplete: **I, IC (Incomplete)** An Incomplete grade is an interim grade designed for students **who are passing** but who through extenuating circumstances have not been able to complete part of the work of the course. An Incomplete grade is assigned at the discretion of the faculty member only when significant elements of the course requirements have not been met. An Incomplete will **not** be assigned when it is necessary for the student to attend a major portion of the class when it is next offered. Written documentation **will be required** to verify extenuating circumstances. **Note:** the 2011-2012 catalog is also available online at the following URL: <http://ecatalog.calstatela.edu/>.
15. **STUDENT RESPONSIBILITY IN CLASSROOM:**
All cell phones and pagers must be turned off during the class time, and particularly during exams and quizzes. Please arrive on time and participate in all components of the course. You will **not** be permitted to leave the classroom during an exam or quiz/activity until you finish, so plan ahead. All books and materials must be stored at the front of the classroom during midterms and final exam. If you have questions during an exam or quiz, raise your hand and I will come to your desk. Do not leave your desk during an exam or quiz until you are ready to submit your materials for grading.
16. **POLICY ON UNIVERSITY WITHDRAWAL FROM THE COURSE:**
Within the first seven days of the quarter, students may withdraw from any course with **no record** of the individual course withdrawal on their permanent academic record. After the “no-record drop” deadline, students may withdraw with a **W** grade from any course, **BUT only** for serious and compelling reasons. Written documentation will be required to verify extenuating circumstances, and **only** Dr. Jefferson will sign add and drop forms for **both** lecture and lab. Do not bring drop forms to class time since I will not sign them until **after** I verify your reasons and justification for dropping the class after the “no-record drop” deadline. To drop the course after the “no-record drop” deadline, you will need to see me during office hours or leave the detailed materials with office staff in BIOS 143. Since there are enrollment restrictions on all courses, you need to decide in week one whether or not you plan to complete the course since you will be preventing someone else from adding the course. Students who do not attend the first lecture on September 22, 2011 **may** be dropped from the course regardless of the reason.
17. **HOW TO SET UP ACCESS TO THE BIOL 340 COURSE HOMEPAGE VIA BLACKBOARD:**
- Open up your web browser and type in the following URL:
<http://webct6.calstatela.edu/webct/entryPageIns.dowebct>
 - Bookmark or Add to Favorites for future reference so you do not have to type the URL again on your computer.
 - On first-time use, click the button labeled Course List.
 - Click on College of Natural & Social Sciences.
 - Scroll down and find BIOL 340.
 - Click on the add icon (little man with a + sign) that appears after the course info to self register.
 - Type in your NIS username and password.

- h. Click on the Register button.
- i. You are now registered for use of Blackboard in this class.
- j. If you wish to see a video of these above steps go to the following website:
http://www.calstatela.edu/academic/aa/ess/elps/media/elpswebct_studentselfreg/WebCT_Student_Self-Registration_Video.htm
- k. In order to access Blackboard, you must have your NIS username and password. If you do not know what your NIS username and password are, you must visit the ITS Help Desk in Library South Palmer Wing Lobby or along main walkway during week 1 of the quarter.
- l. To login to Blackboard, go back to the URL in item (a) above and click on Log In; Click yes when the Security Information window pops up. Then type in your NIS User name and Password

18. CHEATING + PLAGIARISM + ACADEMIC HONESTY POLICY:

If you submit data that were NOT collected for your labs (unless given to you by your lab instructor) or if you copy other students' work in lecture or lab, very grave consequences and sanctions will occur. Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at <http://www.calstatela.edu/academic/senate/handbook/ch5a.htm>. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation. Lab instructors are required to report all suspected cases of cheating, plagiarism, and academic dishonesty to Dr. Jefferson, who in turn, is required to report all suspected cases of cheating, plagiarism, and academic dishonesty to the Campus Judicial Officer.

19. LAB ATTENDANCE:

Weekly attendance in your assigned lab section is required. You are expected to arrive on time for each lab with your lab materials and you are expected to be prepared for each lab. Five points will be deducted for EACH lab missed and/or for EACH lab for which you arrive late or depart early.

20. WEEKLY LAB ACTIVITIES:

WEEK DATES EXPERIMENTS

<u>WEEK</u>	<u>DATES</u>	<u>EXPERIMENTS</u>
0	Sep. 22	NO LAB MEETING
1	Sep. 27-29	a. Blackboard – Make sure that you have properly set up your Blackboard Account b. EXPT. 1 - Introduction to sexing and handling wild and mutant flies. c. EXPT. 2 - Introduction to FlyLab -- Two mutations assigned per student. d. EXPT. 3 - Introduction to PedigreeLab -- Read the intro-text in your PedigreeLab booklet. e. EXPT. 7 - Introduction; make sample 1; add food dishes.
2	Oct. 4-6	a. EXPT. 1 - Identify assigned mutants; make P ₁ crosses. b. EXPT. 2 - <i>FlyLab</i> - Make P ₁ monohybrid, reciprocal crosses; if lethal, cross heterozygotes. c. EXPT. 3 - <i>PedigreeLab</i> - Read Help screens, Glossary & Assignments in <i>PedigreeLab</i> lab. d. EXPT. 7 - Make sample 2; add food dishes.
3	Oct. 11-13	a. EXPT. 1 - Discard P ₁ adults. b. EXPT. 2 - <i>FlyLab</i> - Continue with monohybrid, reciprocal crosses. c. EXPT. 3 - <i>PedigreeLab</i> - One mutation code assigned per student. d. EXPT. 4 - Make P ₁ crosses (<i>3 identical crosses / lab</i>). e. EXPT. 7 - Make sample 3; score sample 1; add food dishes.
4	Oct. 18-20	a. EXPT. 1 - Score F ₁ phenotypes; make F ₁ crosses to produce F ₂ . b. EXPT. 2 - <i>FlyLab</i> - Make P ₁ dihybrid, reciprocal crosses; if lethal, cross heterozygotes. c. EXPT. 3 - <i>PedigreeLab</i> - Determine mode of inheritance for your mutation. d. EXPT. 4 - Discard P ₁ adults. e. EXPT. 5 - Make P ₁ crosses (<i>3 identical crosses / lab</i>). f. EXPT. 6 - Make P ₁ crosses (<i>3 identical crosses / lab</i>). g. EXPT. 7 - Make sample 4; score sample 2; add food dishes.

5	Oct. 25-27	<ul style="list-style-type: none"> a. EXPT. 1 - Discard F₁ adults. b. EXPT. 2 - <i>FlyLab</i> - Continue with dihybrid, reciprocal crosses. c. EXPT. 3 - <i>PedigreeLab</i> - Assign all genotypes to one pedigree for your mutant & export. d. EXPT. 4 - Score F₁ phenotypes; make crosses to produce F₂ (3/lab). e. EXPT. 5 - Discard P₁ adults. f. EXPT. 6 - Discard P₁ adults. g. EXPT. 7 - Make sample 5; score sample 3.
6	Nov. 1-3	<ul style="list-style-type: none"> a. EXPT. 1 - Score F₂ phenotypes. b. EXPT. 2 - <i>FlyLab</i> - Analyze all data and work on final lab report. c. EXPT. 3 - <i>PedigreeLab</i> - Use Large Family Data to determine chromosome location. d. EXPT. 4 - Discard F₁ adults. e. EXPT. 5 - Score F₁ progeny; make testcrosses (3/lab). f. EXPT. 6 - Score F₁ progeny; make F₂ crosses (3/lab). g. EXPT. 7 - Score sample 4.
7	Nov. 8-10	<ul style="list-style-type: none"> a. EXPT. 1 - LAB REPORT DUE b. EXPT. 2 - LAB REPORT DUE. c. EXPT. 3 - <i>PedigreeLab</i> - Use Large Family Data to determine chromosome location. d. EXPT. 4 - Score F₂ progeny; score ears of corn. e. EXPT. 5 - Discard F₁ adults. f. EXPT. 6 - Discard F₁ adults. g. EXPT. 7 - Score sample 5.
8	Nov. 15-17	<ul style="list-style-type: none"> a. EXPT. 3 - <i>PedigreeLab</i> - Determine the precise location of the mutation on the chromosome. b. EXPT. 4 - LAB REPORT DUE. c. EXPT. 5 - Score testcross progeny. d. EXPT. 6 - Score F₂ progeny. e. EXPT. 7 - LAB REPORT DUE. f. Review for LAB FINAL
9	Nov. 22-24	NO LAB MEETINGS THIS WEEK
10	Nov. 29- Dec.1	<ul style="list-style-type: none"> a. EXPT. 3 - LAB REPORT DUE. b. EXPT. 5 - LAB REPORT DUE. c. EXPT. 6 - LAB REPORT DUE. d. LAB FINAL EXAM - 50 pts.

21. REQUIRED ADA (Americans with Disabilities Act) STATEMENT:

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and who requests needed accommodation at the beginning of the quarter.

22. LABORATORY REPORTS:

You are expected to submit a detailed, **TYPED** lab report for full credit. A **brief** statement of the objectives of each experiment should be included in your report. One or five sentences should describe the methods and materials. However, the most important parts of your lab report (that will receive the majority number of points) are your results, data analysis of results, and a discussion and interpretation of what your results mean. Each lab report should neatly present your results in tables, the statistical analysis of data, and should include a discussion and interpretation of your results. Do not manufacture data; if your data do not fit your hypothesis, re-examine it, and/or offer explanations as to why the data were unexpected. **Lab reports that are not completely typed will be worth only 10 points maximum assuming you have properly explained results. Just staple upper left corner of lab report -- do not place in a binder or cover. Read page 1 of lab manual for instructions on how to write your lab report.** All questions, if any, in the laboratory manual or in handouts for a given lab exercise should be answered and included in your lab report. Any additional

questions from your lab instructor should be answered and included with your report. **Late laboratory reports will receive a maximum of half credit (13 pts. assuming it is completely accurate)!** Late lab reports will **NOT** be accepted after reports have been returned to class. **You may turn lab reports in early.** Late lab reports will only be accepted 1 week after they are due and worth a maximum of 13 points assuming everything is accurately provided. After one week beyond the deadline, 0 points will be awarded. Your lab instructor will inform you in lab whether or not there are any changes to the due dates at least one week prior to that due date. To ensure that ALL labs scores are posted in Blackboard BEFORE the date of the lecture final, it is not likely that due dates will change.

23. LABORATORY NOTEBOOK:

Each student is expected to have his/her own lab notebook. Your lab instructor may ask to see the notebook at any time or lab date to evaluate it. If it is not available or if it is not in the correct format, points will be deducted each time. **It must be well organized with a table of contents page(s)** and detailed & organized notes on what you did each week. Purchase a hardcover laboratory notebook (composition book) preferably that already has pages numbered so that NO PAGES are removed. **Set aside the first three pages for the title page that has your name and lab section clearly indicated and the remaining two pages for the Table of Contents.** Divide the rest of your notebook into 7 sections. Each section should have one page indicating the experiment number and the experiment title. You may cross out material that you do not want your lab instructor to evaluate. Again – make sure your name, course name, and lab section appear on the very first page of the lab notebook.

24. MOODLE:

Moodle is an open source learning management system (LMS) providing faculty and students an online presence for their courses. Like Blackboard, Moodle (or "Modular Object-Oriented Dynamic Learning Environment") allows faculty and students online access to sophisticated instructional tools such as discussion boards, assignments, wikis, blogs, online quizzes, file distribution, and more. The CSU license for Blackboard expires on June 30, 2012 and will be replaced by Moodle. During 2011-2012, Moodle will be in various pilot stages of testing and development. There may be activities developed for this course using Moodle. If and when this is the case, more information will be provided to explain how to access such material. If you would like to read more about Moodle, visit <http://www.calstatela.edu/academic/aa/ess/elps/elpsmoodle.php> and other URL links on this webpage. **At minimum**, log into MOODLE and modify your profile so that it has a photo uploaded.