

BIEB 150

Evolution

Winter Quarter 2010

Instructor: Lin Chao

Office Hrs: By appointment. The instructor will always be available after lectures to answer questions. However, if students require additional help on lecture materials, the instructor requests that students first try to address their questions to TA's during section meetings. Because of the size of the class, the instructor cannot meet on a regular basis with individual students. If problems and questions cannot be satisfactorily addressed during section meetings, students are of course welcome to approach the instructor for clarification. If students have general questions or issues (topics not covered by present lectures, suggestions of possible lecture topics, ways to improve the course, career choices in biology, etc.) they are also welcome to approach the instructor. Phone: 858 822 2740; Email: LChao@ucsd.edu; office: 3256 Muir/Biology Building.

Teaching Assistants:

Ellsworth Campbell (ells@ucsd.edu)
Annie Peng (aypeng@ucsd.edu)
Katie Zachariades, (kzachari@ucsd.edu)
David Nguyen (dhn005@ucsd.edu)
Jessica Craft (jcraft@ucsd.edu)

Lectures: Tuesday/Thursday 9:30AM-10:50AM, Center 115

Sections: Please follow announcements in lecture. Sections are supervised by the Teaching Assistants. Attendance of sections is highly recommended, but not mandatory. The goal of the sections is to provide a chance for students to discuss, review and clarify material covered during the lectures. The attendance of sections is not a replacement for attending lectures.

Exams: Midterm and Final to be administered in the same room as lectures, unless otherwise announced. See attached Lecture Schedule for dates and times.

Recommended Text: *Evolutionary Analysis*, 4th Edition, by Scott Freeman and Jon C. Herron. Purves, Pearson Education, Inc., 2007. Recommended for additional reading, but not required.

COURSE GOALS

BIEB 150 offers an introduction to evolution. In this class, the process of evolution is taken from the perspective of a population. In biology, we can study how molecules are assembled to produce cells. Although some organisms are single-celled, we can also study how cells are in turn assembled to create more complex organisms. If we go one level higher, we find that organisms exist in populations. The goal of this course is to understand how interactions at the population level can help us understand the evolution of organisms.

This course is more theoretical and mathematical than most courses in the biological sciences. The objective is to develop a framework to understand and think about the process of evolution, instead of providing a large body of facts to substantiate evolution. Algebra and genetics are used extensively, so you will be expected to be comfortable with both.

PREREQUISITES AND REQUIREMENTS

BILD 1 and 3 are prerequisites for this course. Although I try to review background material whenever necessary, materials familiar to most students cannot be reviewed in detail. If you have difficulties recalling some of the basic information, I suggest that you review it by going over an appropriate introductory text book. If you need a refresher or review, please take it as early as possible and not after you have fallen behind.

Although math classes are not a prerequisite for BIEB 150, math and algebra are used extensively in the course. As stated earlier, you will be expected to be comfortable with math, especially algebra.

ADVICE

Because the lectures in this course build on material from previous lectures, you will be seriously hurt by missing lectures. Reading the text book helps, but the text is meant to supplement and not replace the lectures. If lecture notes become available, they also should not be treated as a replacement to both attending the lectures or taking your own lecture notes. Learning to listen to a lecture and then recording your own notes, by your own hands, is an invaluable skill. Take extensive and complete notes. Recording only an outline of the lecture is not sufficient. Record everything that is stated or presented on the chalk board. You will find that you will retain much more information if you force yourself to listen and then translate the information into your own notes. Learning by listening and taking notes is possibly the single most important skill that you can acquire from four years of college education. Most information you learn from your classes will become outdated. Listening and taking notes will never become outdated, despite whatever new communication technologies might arise, and they will allow you to continue to learn.

If you attend lectures and take notes, the next secret to succeeding in this course is to go over your notes the same day as the lecture. Rereading your notes the same day takes advantage of the fact that the material is still fresh in your mind. You will find that you can recall much more information (that same day) than you actually recorded in your notes during class. If you recall additional information, write it down and add it to your notes. If you have questions, have them clarified immediately with your TA or instructor.

This is not a very difficult course. The amount of material presented is not overwhelming. I will make an effort to adjust the lectures to your pace. However, because the lectures build on each other, you must put a constant and steady amount of effort into the lectures. If you fall behind, the interaction between the different lectures will make it difficult for you to recover. If you keep pace, this course should become a rewarding learning experience for all of us.

GRADES

The final grade for the course is based on your score on the midterm exam and the final exam. The two exams are weighed equally, i.e., they count each for 50% of the final grade. The average grade in my past classes has been somewhere between B and C.

MAKE-UPS AND REGRADES

- 1) A valid excuse for missing an exam is a medical or family reason. Appropriate documentation (for example, letter from doctor) is required. Extraordinary circumstances will be considered on a case by case basis by the instructor. Make-ups for exams will be given only with a valid excuse.
- 2) A make-up exam will be given at a later time to be arranged between the student and instructor. The format of the make-up exam (written, oral, essay, multiple choice, etc.) will be decided by the instructor. If you miss an exam without a valid reason, you will receive no points for the exam grade.
- 3) Requests for regrading of exams must be made in writing within one week after exam is returned and/or answer key is posted. Please explain concisely why you consider the grading is unsatisfactory. All additional communications on regrade between the instructor and student will be conducted by email. The instructor will not meet one on one with students to discuss grades and regrades.

Lecture Schedule
Winter 2010

BIEB 150 - Evolution

Date	Topic	Suggested Reading: Chapters in Freeman and Herron
5-Jan	A case for evolution: The Meaning of Life	17
7-Jan	Genetic Variation and Mutations	5
12-Jan	Modeling a population without evolution: Hardy-Weinberg	6
14-Jan	Selection as an agent of evolution: Directional Selection	6
19-Jan	Selection for Heterozygote	6
21-Jan	Selection against Heterozygote	6
26-Jan	Other agents of change: Migration and Mutations.	6,7
28-Jan	Genetic Drift.	7
2-Feb	Meiotic Drive.	
4-Feb	REVIEW	6
9-Feb	MIDTERM	
11-Feb	Frequency Dependent Selection	8
16-Feb	Evolution of Sex and its Consequences	11
18-Feb	Evolution of Genomic Imprinting and Sexual Conflicts	
23-Feb	Evolution of Mating Systems	11
25-Feb	Evolution of Polyandry in Acorn woodpeckers: A case study of local interest.	13
2-Mar	Game Theory	7
4-Mar	Competition and Diversification	13
9-Mar	Predators and Virulence	14
11-Mar	Evolution of Senescence: a case study of life history tradeoffs	
16-Mar	Final Exam - 9:00AM-11:00AM	Location TBA