

## **PCB 4683 Population Biology and Evolution Spring Semester, 2007**

This course provides an introduction to the topics of population biology, population genetics and evolutionary biology. The approach will not be descriptive but instead will emphasize basic principles and theory. Basic evolutionary genetics will be considered as the foundation underlying all aspects of evolutionary biology. Concepts in speciation, adaptation, classification, and macroevolution will be considered. The importance of evolutionary concepts to all facets of biology will be stressed, with special emphasis on the interplay between evolution and the traditional fields of ecology, genetics, and development.

### **Course objectives**

To understand the principles of population genetics, including selection, genetic drift, linkage, and gene flow.

To understand the mechanisms of speciation and diversification.

To understand the relevance of evolutionary biology to human society, particularly human health issues.

To become a skilled reader and critic of scientific literature.

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### **PREREQUISITES:**

A Grade of C or better in undergraduate genetics and ecology courses or consent of the instructor. A good understanding of basic genetics and ecology is vitally important to your success in this class.

### **TIME AND PLACE:**

Lecture: 8:30 -10:20 Tuesday and Thursday in ENG 102.

**Lab 11: 8:30 – 10:20am Monday in BL, Rm 414**

**Lab 12: 10:30 – 12:20pm Monday in BL, Rm 414**

**Lab 13: 1:30 – 3:20pm Monday in BL, Rm 414**

### **CREDIT:**

Lecture (PCB 4683A): 4 semester hrs.

Lab (PCB 4683L): 1 semester hr.

<b>LECTURE INSTRUCTORS</b>	<b>LABORATORY TEACHING ASSISTANT:</b>
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### **OFFICE HOURS:**

Generally, we will be available during our respective office hours. However, this may not be the case on any specific day. Therefore, you are requested to please email and schedule an appointment for all of us. For questions concerning the class please see Dr. Parkinson or Juan Daza, and for the lab see either Jack Degner or Juan Daza. Dr. Parkinson's office hours will be Tuesday 10:30-12:00 and Wednesday 8:00-10:00 a.m.; additionally Dr. Parkinson will be available online in WebCT in the chat room on Wednesdays from 8-9 p.m. Mr. Daza's, office hours are Tuesday 2:00-4:30 p.m. and Thursday 2:00-4:30 p.m. While Jack Degner's

are: Monday 12:00-5:00p.m.

**WEBCT SITE:**

I have a course web site set up on WEBCT (<http://reach.ucf.edu/~pcb4683b/>). I will use this to post a course outline, the syllabus, announce exam dates, PowerPoint notes and homework assignments. Please check the site regularly. I will also hold online office hours and discussions; please check daily.

**REQUIRED TEXT:**

*Evolutionary Analysis, 4th edition 2007. By Freeman and Herron. Prentice Hall, Inc., Upper Saddle River, NJ ISBN 0132275848*

**EVALUATION:**

Your grade will be comprised of three exams plus a cumulative final. Each exam and the final are worth 18%; WebCT and in class quizzes, in class writing assignments and homework is worth 18%; the remaining 10% is attendance and participation. Participation includes both in-class discussions and discussions on WebCT. Exams will include multiple choice, short answer, essay questions and math problems. Life is comprehensive and so are the exams in this course, and the FINAL IS CUMULATIVE. Each exam will emphasize specific material covered since the previous exam, each of them will include questions that require you to draw on concepts or specific information learned earlier in the course. Evaluation and grading in lab (PCB 4683L) are separate from lecture grading; procedures will be announced in lab.

**ATTENDANCE:**

Attendance is required, I will spot check attendance and this will be part of your grade. You will learn more effectively if you actively attend and interact in class.

**FINAL AND GRADES:**

There will be a **comprehensive** final exam for this course. The final exam is Tuesday April 24<sup>th</sup> at 7:00-9:50am. There will be **no** makeups for the final exam, if you miss the final you will be scored zero.

The following scale will be used to assign course grades. There will be no further curve.

<b>93-100 = A</b>	<b>77-79 = C+</b>
<b>90-92 = A-</b>	<b>73-76 = C</b>
<b>87-89 = B+</b>	<b>70-72 = C-</b>
<b>83-86 = B</b>	<b>60-69 = D</b>
<b>80-82 = B-</b>	<b>≤ 59 = F</b>

**MAKEUPS:**

Do not miss exams for any reason. If an acceptable absence (as defined in the UCF undergraduate catalog) forces you to miss an exam, you need to make arrangements **prior to** the exam being given. If you do not make prior arrangements, the exam will be scheduled at the discretion of the faculty member or during the final exam period. If you miss an exam, for other than an acceptable absence, your score will be a zero. There will be **no makeup's** for missed quizzes, in class assignments or homework, you will be scored zero! If you are not going to be in class due to an excused absence (see above) you **must** turn in the assignment **prior** to the missed class (due date) to get credit.

**CHEATING:**

Don't. I will not tolerate cheating or plagiarism of any type and will pursue disciplinary actions to the fullest extent possible. The guidelines of the "Golden Rule" will apply.

**WITHDRAWAL:**

The deadline for withdrawal without penalty is published in the schedule, March 2, 2007. You will need to decide whether or not to stick with the course by that time. We do not give grades of Incomplete.

**EXPECTATIONS:**

You should have certain minimal expectations of us (all instructors). Among other things, you can expect us to (1) show up for class, (2) be punctual, (3) be prepared for class, (4) not waste your time, (5) answer your questions to the best of our ability, (6) do our best to present a thorough, modern perspective on the subject matter, (7) be fair in our evaluation of your performance, and (8) respect you as an individual. We, likewise, have expectations of you. Most of these should be obvious, but we will state them here so that there is no misunderstanding. We expect you to (1) show up for class, (2) **Do not come in late or leave early**, (3) sit near the front of the room to facilitate effective communication, (4) not talk in class or otherwise disrupt the learning environment for others (*no cell phones or pagers*), (5) come to class prepared by reading the designated materials and completing assignments, (6) ask questions as appropriate and relevant to the material under discussion, (7) study hard, and (8) give us your "best shot" at doing well in the course. **Please do not be late or leave early, this disrupts the class. CELL PHONES ARE PROHIBITED IN MY CLASS, IF A CELL PHONE RINGS, A QUIZ WILL BE GIVEN.** The person whose cell phone rings **will be scored zero for that quiz.** Please turn them off prior to entering the room.

## TENTATIVE LECTURE OUTLINE AND DISCUSSION TOPICS

**We reserve the right to change this schedule on a moments notice; changes will be posted on the WebCT!**

Date	Topic/Activity	Reading
8/21/07	Introduction, HIV evolution-	Chapter 1 (Pre-test)
8/23/07	HIV Con't and Start Pattern of Evolution	Chapter 2; – Hand out Assignment 1. Online quiz 1 (Chapt. 1-2)
8/28/07	Natural Selection and Scientific Method	Chapter 3.
8/30/07	Finish Natural Selection and Scientific Method	Online quiz 2 (Chapt. 3-4) Assignment 1 Due ID argument
9/04/07	Phylogenetic Reconstruction	Chapter 4. Assignment 2 handed out – How did the leopard get its spots
9/06/07	Phylogenetic Reconstruction	Online quiz 3 (Chapt. 5)
9/11/07	Mutation and Genetic Variation	Chapter 5. Assignment 2 Due
9/13/07	<b>Exam 1</b>	Chapter's 1-5.
9/18/07	Population Genetics	Chapter 6; Online quiz 4 (Chapt. 6)
9/20/07	Population Genetics	Chapter 6; handed out – Simulation and modeling of population genetics
9/25/07	Migration, Drift and nonrandom mating	Chapter 7; Online quiz 5 (Chapt. 7)
9/27/07	Migration, Drift and nonrandom mating	Chapter 7; Assignment 3 Due
10/2/07	Linkage & Sex	Chapter 8 Online quiz 6 (Chapt. 8)
10/4/07	Quantitative Genetic Variation	Chapter 9
10/9/07	Studying Adaptation / Experimental design	Chapter 10 Online quiz 7 (Chapt. 9-10)
10/11/07	Experimental design	Chapter's 10
10/16/07	<b>Exam 2</b>	Chapter's 6-10.
10/18/07	Sexual Selection	Chapter 11 Online quiz 8 (Chapt 11)
10/23/07	Sexual Selection	Chapter 11 Assignment 4 handed out
10/25/07	Kin Selection and Social Behavior	Chapter 12 Online quiz 9 (Chapt 12)
10/30/07	Finish Social Behavior / ESS exercise	Chapter 12 Assignment 4 Due
11/1/07	Life history Evolution	Chapter 13; Online quiz 10 (Chapt. 13)
11/6/07	Human Health and Evolutionary Genomics	Assign Pages (Chapter's 14, 15)

11/8/07	Species Concepts	Chapter 16 Online quiz 10 (Chapt. 16)
11/13/07	Mechanisms of Speciation	Chapter 16
11/15/07	<b>Exam 3</b>	
11/20/07	Evolutionary Development	Chapter 19 Online quiz 11 (Chapt. 19)
11/22/07	Thanksgiving	
11/27/07	Human Evolution	Chapter 20
11/29/07	Course Review	
12/?/07	<b>Final Exam</b>	35% Chapter 19, 20 65% cumulative

PCB 4683, Dr. Hoffman  
Fall 2007

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