

# PCB 4674: Evolution; Section U02

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## Required textbook

Herron JC & S. Freeman. 2013. Evolutionary Analysis. Fifth Edition. Pearson.

Companion website:

[http://wps.pearsoned.com/bc\\_freeman\\_evolution\\_5/239/61342/15703574.cw/index.html](http://wps.pearsoned.com/bc_freeman_evolution_5/239/61342/15703574.cw/index.html)

## Required readings

Required readings (scientific articles) and the PDF files of the lecture slideshows will be available on canvas.fiu.edu. I'll post slideshows at the end of each week. There is much overlap between the lecture and book (which also serves as a general course outline) but I will present additional materials that appear only in lectures which will be included in class assessments.

## Course format

The course consists of two lectures per week. There will be weekly quizzes, unscheduled, which will also serve the purpose of tracking attendance. These quizzes may be at the beginning or at the end of any class. There will also be three term exams, generally not cumulative, and the final exam, which is cumulative. Finally, there will be graded assigned readings and worksheets throughout the semester, some of which are individual work and some group work.

## Course Description and Purpose

The purpose of this class is to provide an introduction to evolution and evolutionary processes. The main conceptual areas of the course are an overview of evolutionary processes and their contribution to biological change over time and space; the study of these processes, with an emphasis on adaptation; and the origin and evolution of life, through the use of the fossil record, phylogenies and evolutionary models. The students will gain a holistic understanding for the evidence of evolution in all life forms, acquire the ability to identify evolutionary processes underpinning biological change, develop "tree-thinking" skills, and appreciate the scientific foundations and efforts underlining the theory of evolution.

## Course Objectives

Upon completing this course, students will be able to:

- Achieve understanding of principles and application of evolutionary biology
- Master a holistic understanding of the evidence of evolution.
- Achieve understanding of current research and knowledge gaps in the field.
- Make the links between evolution and the fields of ecology, genetics, and physiology.
- Master the understanding of the relationship between genetic variability, selection, genetic drift, genetic isolation, and stochastic processes.
- Develop “tree thinking” skills.
- Strengthen their understanding of the foundations of the scientific process.

### Class schedule (subject to modification)

Wk	Day	Date	Topics	Readings
1	Tu	21 Aug	Review of syllabus; introduction to evolution	Ch. 2
1	Th	23 Aug	Patterns of evolution	Ch. 2
2	Tu	28 Aug	Natural selection, Darwin's contribution	Ch. 3, Darwin 1859 <a href="#">ch. 4</a> & <a href="#">ch. 5</a>
2	Th	30 Aug	Natural selection; case studies; ghost of evolution past	Driscoll et al 2007; <a href="#">Selection @ CCR5-Δ32</a> , He et al
3	Tu	4 Sep	Evolutionary and tree-thinking	Ch. 4
3	Th	6 Sep	Phylogenies	Ch. 4
4	Tu	11 Sep	Case study: where did HIV come from?; worksheet exercise	Ch. 1; Gilbert et al. 2007; readings TBA
<b>4</b>	<b>Th</b>	<b>13 Sep</b>	<b>Exam 1</b>	<b>Ch. 1, 2, 3, 4</b>
5	Tu	18 Sep	Genetic variation	Ch. 5
5	Th	20 Sep	Selection	Ch. 6; Barrett et al 2008
6	Tu	25 Sep	Mutation	Ch. 6; Oliver et al 2000
6	Th	27 Sep	Migration, Genetic Drift, & Nonrandom mating	Ch. 7; Kimura 1968
7	Tu	2 Oct	Evolution at multiple loci: Linkage and Sex	Ch. 8
7	Tu	4 Oct	Quantitative genetics	Ch. 9

8	Tu	9 Oct	Quantitative genetics; worksheet exercise	Ch. 9, Balanya et al 2006
<b>8</b>	<b>Th</b>	<b>11 Oct</b>	<b>Exam 2</b>	CH, 5, 6, 7, 8, 9
9	Tu	16 Oct	Adaptation – form and function	Ch. 10
9	Th	18 Oct	Studying adaptation; case studies	readings TBA
10	Tu	23 Oct	Sexual selection	Ch. 11; Gerhardt et al 06, Zuk 06
10	Th	25 Oct	Kin selection and social behavior	Ch. 12
11	Tu	30 Oct	Life histories and aging	Ch. 13
11	Th	1 Nov	Evolution and human health	Ch. 14; reading TBA
12	Tu	6 Nov	Review	
<b>12</b>	<b>Th</b>	<b>8 Nov</b>	<b>Exam 3</b>	Ch. 10, 11, 12, 13, 14
13	Tu	13 Nov	Speciation	Ch. 16; reading TBA
13	Th	15 Nov	The origins of life & Precambrian evolution	Ch. 17
14	Tu	20 Nov	The Cambrian explosion and beyond	Ch. 18
14	<b>Th</b>	<b>22 Nov</b>	<b>Thanksgiving - no class</b>	
15	Tu	27 Nov	Development and evolution	Ch. 19
15	Th	29 Nov	Review	Ch. 17, 18, 19
16	<b>Tu</b>	<b>3 Dec</b>	<b>Final exam</b>	

## Important Information

Before starting this course, please review the following pages:

- [Accessibility and Accommodation](#)
- [Academic Misconduct Statement](#)

\*The professor reserves the right to change or modify the syllabus at any time during the semester.

## Grading

All non-medically related makeup examinations will be given in advance of the regularly scheduled exam, and must be scheduled TWO meetings in advance. Medical excuses for missing an exam will require documentation. I use the following formula for calculating the value of late assignments:  $A = G (0.9^x)$  where G is your score on the assignment, X is the number of weekdays late and A is your adjusted score.

## Grade breakdown

There will be three in-term exams and a comprehensive final. Final grades will be based on the percentage of the total possible points that you earn in the class:

1. Participation, homework, quizzes and various in-class activities = 25%
2. Three hourly exams = 50%
3. Comprehensive final = 25%

## Exam etiquette

The dates of the exams are given on the course syllabus. For in-term exams, makeup exams will be given only with a verifiable and reasonable cause (such as: student-athlete competitions, major illness, etc.). If you are a member of an athletic team, please inform me as soon as possible of the days you will be away from campus. The in-term exams cover the material listed in the syllabus. The final exam will be comprehensive and the date and time CANNOT be changed.

Exams are closed notes/books and cheating is of course unacceptable; if you are caught cheating you will be given a zero on that exam or assignment and depending on the situation you may be given an F for the entire course. "Wandering eyes" during exam or quiz time will be interpreted as cheating; keep your eyes on your own paper. FIU has a CODE OF ACADEMIC INTEGRITY that you should be familiar with (<http://integrity.fiu.edu/misconducts.html>). All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions.

## Grading Scheme

Letter	Range%	Letter	Range%	Letter	Range%
A	95 or above	B	83 - 86	C	70 - 76
A-	90 - 94	B-	80 - 82	D	60 - 69
B+	87 - 89	C+	77 - 79	F	59 or less

## Assigned readings & homework

Please read the assigned chapters/pages before coming to class. Save some trees and use Acrobat Reader to read articles (posted on canvas). Be prepared to answer and ask questions. Complete assigned homework on time. We will have one quiz every week except for weeks when we have an exam. The exact dates for quizzes will not be announced; review the material and be prepared to answer questions.

## Participation & in-class activities

Learning requires the active participation of both the students and the instructor. Your contributions to the class and your interactions with the class are an essential component of your learning experience and of the learning experience of your classmates. I expect you to ask and answer questions, share observations with the class and listen respectfully to your classmates questions and observations. I expect everyone to respect the rights of others to express their views, and to be able to participate in civil discourse. Disagreement is encouraged; disrespect and disruption will not be tolerated.

## Attendance, timely arrival, classroom etiquette

Class attendance is essential for your understanding and comprehension of the course material. Given that this class in particular does not follow a textbook word by word, attendance is mandatory. Most of the material on exams comes directly from the lecture; you must attend lectures to do well on tests. I will keep track of your attendance through unscheduled weekly quizzes and in-class assignments.

You are expected to arrive on time. Arriving late disrupts the class and shows a lack of respect for your fellow students and the instructor. Cell phones, smart phones, and other devices with wireless capability must be turned off during class. Please be respectful of your classmates and do not engage in any activity that will disrupt the classroom.

## Disability resources

Students who have a documented physical, psychological, medical or learning disability that affects their ability to access information and/or materials presented in this course are strongly encouraged to contact Disability Resource Center, Graham Center 190 ph:(305) 348-3532 as soon as possible. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their instructor.. All arrangements and discussions will remain confidential.

## Religious holydays

The University's policy on religious holy days as stated in the University Catalog and Student Handbook will be followed in this class. Any student may request to be excused from class to observe a religious holy day of his or her faith.