

Evolution
BIOL 4510/5450 - Spring 2015

Instructor: Prof. Moira van Staaden, Rm 303 Life Sciences Building (Tel: 372-0341)
<mvs.bgsu@gmail.com> Office Hours TuTh 10:45-11:45am or by arrangement

Course Format (3 Credits):

Lectures: TuTh 9:30am - 10:45am (Olscamp 113 at BGSU)

Course Description & Outcomes: The goal of this course is to provide students with a basic understanding of the fundamental concepts of evolution. In achieving this, you will (1) become familiar with the major mechanisms of evolutionary change; (2) gain an appreciation of the history of life on earth; (3) learn to analyze biological data from an evolutionary perspective; and (4) understand how evolutionary theory interacts with other fields of biology; (5) gain proficiency in reading and writing scientific prose through a writing assignment.

Text: *Evolutionary Analysis* 2013 Herron JC & S Freeman, Benjamin Cummings (5th Edition)
ISBN: 9780321616678

Website: Here you will find handouts, paper pdfs, questions for discussion, and additional resources <<http://caspar.bgsu.edu/~courses/4510/>>

Course Grading: Your class grade will reflect performance as follows:.

Assignment	Points	% of final grade
Exam 1	100	20%
Exam 2	100	20%
Exam 3 (Comp. final)	150	30%
Class activities	150	30%
Total	500	100%

Exams: Exams based on material in lecture, handouts, and the text will assess your grasp of the material and your ability to synthesize. We will have two regular exams and a comprehensive final exam. All exams will be short answer/short essay, with occasional problems, and multiple choice questions. The exam schedule is indicated below. Make-up examinations will be given only under extreme circumstances, which you should be prepared to document. You must make every effort to contact me prior to an exam you are unable to attend. There is no extra credit. Graduate students will have additional readings, an essay assignment, and are expected to demonstrate a deeper and broader understanding of the literature and concepts of evolutionary biology (A=92%).

Class activities: Discussions and class activities will comprise two phases. Initially, we will discuss the problem/papers in small groups of 5 students each. Then we will coalesce groups and continue the discussion with the class as a whole, during which groups will share ideas and concerns they had previously formulated. One student in each group will be responsible for leading the discussion/activity within the small groups. The *Discussion Leader is responsible for* (1) generating and directing the discussion; and (2) communicating the findings/questions of the small group to the class as a whole during the latter part of the class period. However, *all* group members are expected to discuss the material, actively participate

in problem solving, be prepared to raise difficult or confusing aspects in the large-group discussion, and must turn in a brief written analysis within 1 week of the activity/paper.

Attendance Policy: Attendance is required at all lectures and discussion sections. You are allowed two unexcused absences; each additional absence will lower your course grade 5%. Missed quizzes and exams can be made up only in cases of legitimate hardship (accident, illness etc), and when a signed excuse is provided by a physician or appropriate university official. Assignments and activities generally cannot be made up because they require in-class interactions.

Policy on Academic Integrity: We follow and enforce the policies as set forward in the student handbook <http://www.bgsu.edu/content/dam/BGSU/student-affairs/Student-Conduct/documents/Student-Handbook.pdf>

Your Responsibilities:

- Be punctual and participate in class and its activities.
- To get the most out of this course, you *must* do the required readings before each class period. The chapters relevant to each lecture topic are indicated in the syllabus.
- Your participation is essential for this course and the quality of your participation is a direct result of your reading the required material.
- Take notes on what you do not understand, and formulate questions for class periods. Ask questions when you don't understand—this is very important! Make use of office hours, or email me with specific areas that were unclear or that have you confused. I will cover them at the beginning of the next class.
- Some exercises require group participation. For effective group learning you must be able to voice your own opinion clearly, and listen to other people and ideas.
- Contact me promptly to discuss any problems that affect your performance in class.

Tentative Course Outline

Week	Date	Lecture topic	Readings/Assignments
Course Overview & Introduction			
1	T, 13 th Jan	Introduction & Background	Chp 1
	Th, 15 th Jan	Discussion: Non-overlapping Magisteria***	Handouts: Gould 1997 & Forrest 2004
2	T, 20 th Jan	A short history of evolutionary thought	Chp 2
Tracing evolutionary pattern			
	Th, 22 nd Jan	Intro to Natural Selection*** Video: Illustrated Origin of Species	Chp 3 Downloads: Futuyma 2004
3	T, 27 th Jan	Natural selection contd	Chp 3
	Th, 29 th Jan	Tree Thinking	Chp 4
4	T, 3 rd Feb	Origin and diversification of life	Chp 17
	Th, 5 th Feb	Tracing Phylogeny	Chp 4

Microevolutionary processes			
5	T, 10 th Feb	Extinction & Evolutionary Trends	Chp 18
	Th, 12 th Feb	Sources of genetic variation	Chp 5
6	T, 17 th Feb	Exam 1	
	Th, 19 th Feb	Population genetics: Equilibria-HW***	Chp 6
7	T, 24 th Feb	Population genetics: Selection, mutation etc	Chp 6
	Th, 26 th Feb	Evolution in finite populations: migration, drift & inbreeding	Chp 7
8	T, 3 rd March	Population genetics contd.	Chp 8
	Th, 5 th March	Evolution at multiple loci: Quantitative genetics	Chp 9
9	9-13 th March	Spring Break	
10	T, 17 th March	Evolution at multiple loci: Why sex?***	Chp 9
Adaptations for reproductive success			
	Th, 19 th March	Evolution of Behavior: Sexual selection***	Chp 11
11	T, 24 th March	Evolution of sociality	Chp 12
	Th, 26 th March	Exam 2	
12	T, 31 st March	Coevolution	
	Th, 2 nd April	Evolutionary Medicine	Chp 14
13	T, 7 th April	Major Transitions	
	Th, 9 th April	Evolution & development***	Chp 19
14	T, 14 th April	Species & Speciation I	Chp 14
	Th, 16 th April	Species & Speciation II	Chp 14
Special topics			
15	T, 21 st April	Species & Speciation III	Chp 14
	Th, 23 rd April	Human Origins	Chp 20 Grad essays due
16	T, 28 th April	Becoming Human	
	Th, 30 th April	Evolutionary Psychology	Downloads: Panksepp
17	Wk 4-8th	Exam 3 - Final	

*** group assignments