Evolutionary Biology Syllabus, Winter 2015 (BIO505 / CRN25098)

"Nothing in biology makes sense except in the light of evolution." -*T. Dobzhansky*

Instructor: Dr. Katy Greenwald
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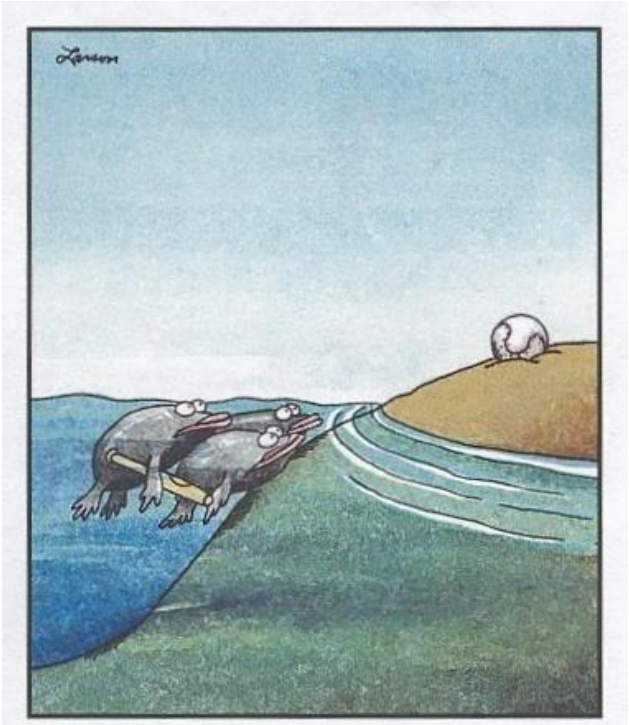
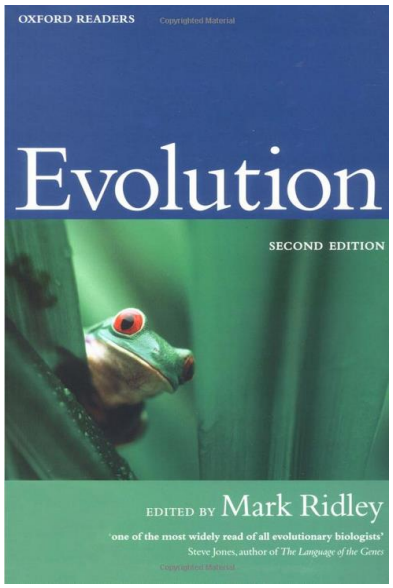
Organizational details: Class occurs Tuesday/Thursday 3:30-4:45 PM in Mark Jefferson 173. Office hours will be Monday and Thursday 9-11 AM and by appointment in Mark Jefferson 401-N.

Catalog description: This graduate course provides a conceptual foundation in theory, mechanisms and processes of evolutionary biology. Presentation and discussion of primary literature is integral and will emphasize evolution's fundamental role in all areas of biology.


Great moments in evolution

Course Goals: The overall goal of this course is to enable you to understand the history, mechanisms, and implications of biological evolution. We will begin by "covering the basics" of each topic; however, the majority of our time will be spent with primary literature. We will revisit classic works, explore exciting recent advances in the field, and consider the relevance of evolution to numerous other areas of study (e.g., medicine, agriculture, conservation, etc.). Class time will be light on lectures, and heavy on discussion/debate of primary scientific literature. I aim for a dynamic classroom atmosphere where lectures are participatory, and questions, discussion, and collaboration are strongly encouraged.



Required reading:
Evolution (second edition) Oxford Reader, edited by Mark Ridley

Additional primary literature **will** be assigned as the semester progresses, and will be made available on **EMU-Online** (e-college).

Class schedules and policies are subject to change. **Students are responsible for changes announced in class or online.**

Grading Procedures and Scale (*see below for details*):

Evolutionary Tree Problem Set	50 pts
Annotated bibliography	50 pts
Lead discussion	100 pts
Lit review	100 pts
Proposal Outline	50 pts
Proposal Draft	50 pts
Peer Review	50 pts
Final Proposal	150 pts
Ridley Submitted Questions	50 pts
Participation	100 pts
TOTAL	**750 pts**

Percentage	Grade
93-100%	**A**
90-92%	**A–**
87-89%	**B+**
83-86%	**B**
80-82%	**B–**
77-79%	**C+**
73-76%	**C**
70-72%	**C–**
67-69%	**D+**
63-66%	**D**
60-62%	**D–**
<60%	**F**

General structure of the course: Most weeks, a new topic will be introduced on **Tuesday**. I will introduce the topic in lecture, and we will discuss classic papers from the Ridley text. On **Thursday**, two students will present and lead discussion on two recent primary literature papers related to that week's topic (dates with * on course schedule, below). Students will sign up for presentation dates on the first day of class. Students will likely present **twice** over the course of the semester, depending upon enrollment.

Selection of papers for presentation: (1) Each partner will create an annotated bibliography for **four papers** within your assigned discussion topic. (2) Meet with your partner to pick **two** of the six papers for discussion. When making your decision, please consider how related they are to the week's topic and evolution in general; how well they complement each other for a cohesive discussion; and whether they provide good "fodder" for discussion. Once you have chosen your two discussion papers, email me the annotated bibliographies and pdfs of the chosen discussion papers. **Discussion papers must be submitted to me one week before your presentation date.**

Student presentations: You will prepare a PowerPoint presentation in which you introduce the paper (explicitly identifying the question the research addressed), briefly cover major methods and results, and suggest at least five points for discussion (e.g., What would your next step be if you were the researcher? What questions were you left with? What didn't you understand? Did you see any flaws in the methods or interpretation? What does this paper tell us about the broader topic?). Be sure to include any figures from the paper that will facilitate discussion. Each student should lead discussion on one of the papers. **PowerPoint files (.ppt or .pptx) must be submitted to me by email at least 24 hours before your presentation.**

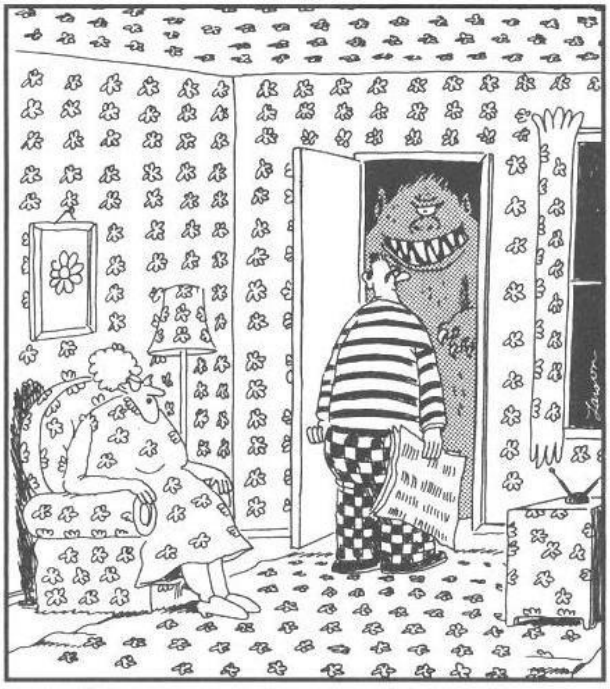
Proposal: You will prepare a scientific proposal on an evolutionary topic of your choice. You must identify a research question of interest, provide sufficient background information (literature review) to describe the current state of knowledge in the field, and propose a study or experiment to test your predictions. You will also peer review a colleague's proposal. More information and guidelines for this assignment will be provided later in the semester.

Policy on attendance and late assignments: You are, of course, strongly encouraged to attend class. **You are expected to participate in all discussions.** There are 100 points available for participation throughout the semester, which you cannot acquire if you are not present. **Late submission of discussion papers or PowerPoint files will result in a 10%/day penalty.**

Statement on disability: I will gladly attempt to accommodate any student who may need accommodations for the effects of an appropriately documented disability. Please contact me to discuss specific needs. For support services, please contact the Students with Disabilities Office (734-487-2470; http://www.emich.edu/disabilities/index.html).

Statement on diversity: I am committed to the goals of creating a welcoming climate for all students and promoting a shared, inclusive understanding of diversity. If you have any concerns about diversity-related issues, please contact the instructor or the Office of Diversity and Affirmative Action (734-487-1166; http://www.emich.edu/diversity/).

Statement on academic integrity: The University's Code of Student Conduct outlines three examples of academic misconduct: cheating, falsification, and plagiarism. **Ignorance of the University's Code of Student Conduct is never considered an "excuse" for academic misconduct.** You will find that this course offers ample opportunity for collaboration and that joint efforts will often be encouraged. However, certain assignments will require that you do your OWN work. If you have any question as to whether your level of cooperation with your peers (or the similarity of your work to that of others) is acceptable, you must contact me to discuss the matter BEFORE handing in the assignment. ***Academic misconduct will result in failure of the course.***



When the monster came, Lola, like the peppered moth and the arctic hare, remained motionless and undetected. Harold, of course, was immediately devoured.

Course Schedule

Date	Topic	Reading
Tu 1/6	Introduction; presentation sign-up	Ridley introduction and section A
Th 1/8	Estimating evolutionary trees	Baum "tree thinking" article
Tu 1/13	Natural selection and random drift in populations	Ridley section B
Th 1/15		Weaver et al 2007
Tu 1/20	Adaptation	Ridley section C
*Th 1/22		
Tu 1/27	Speciation and biodiversity	Ridley section D
*Th 1/29		
Tu 2/3	Macroevolution	Ridley section E
*Th 2/5		**Literature Review Due**
Tu 2/10	The history of life	Ridley section G
*Th 2/12		
Tu 2/17	Evolutionary genomics	Ridley section F
*Th 2/19		
Tu 3/3	Case studies	Ridley section H
*Th 3/5		**Proposal Outline Due**
Tu 3/10	Kin selection and social behavior	Maynard Smith 1964 & reply
*Th 3/12		
Tu 3/17	Sexual selection	Emlen & Oring 1977; Roughgarden 2006 and responses
*Th 3/19		**Proposal Draft Due**
Tu 3/24	Human evolution	Ridley section I
*Th 3/26		
Tu 3/31	Evolution & medicine	Williams & Nesse 1991; Pennisi 2011
*Th 4/2		**Peer Review Due**
Tu 4/7	The debate of group selection	Evolutionary Restraints excerpt; Borello 2005; Ruse 2013
Th 4/9	Evolution & conservation	Crandall et al. 2000; Stockwell et al 2003
Tu 4/14	Evolution and human affairs	Ridley section J
Th 4/16	Teaching evolution	Scott 2010 Kitzmiller v. Dover
M 4/21	Evolution in the news	**Proposal Due**

"Ridley" refers to the textbook (see page 1 for details). All other readings will be made available on EMU-Online.

Asterisks (*) denote student presentation days.