

**Syllabus**  
**Evolutionary Biology**  
**Anthropology/Botany/Zoology 410**  
**Spring 2015**

**Lectures:** Monday/Wednesday 3:30-4:20 Room 168 Noland Hall

**Discussion:** Thursday/Friday

**Instructor:** Jeremy Glasner, Ph.D.

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**Office Hours:** Tuesdays 1-2pm or by appointment

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**Grading:**

Three multiple choice exams of equal weight (3 x 100 pts each)

Discussion Section Activities (100 pts)

Total: 400 points

Grading scale: 92-100% = A; 88-91% = AB; 81-87% = B; 77-80% = BC; 70-76% = C; 60-69% = D; 0-59% = F

**Required Reading:**

Textbook: *Evolutionary Analysis*, Authors Herron & Freeman, Pearson, 5th Edition 2014

Additional Readings: Articles and materials posted with lectures on learn@uw

**Note that this syllabus is subject to revision. In particular the list of readings for each lecture will be supplemented with additional materials as the semester progresses. Students are encouraged to check the course website at learn@uw for the most up-to-date course documents.**

**Policy for use of electronic devices.** Please respect others in the classroom if you use a device. I would appreciate if students would refrain from recording lectures without prior approval. Course materials that we provide to you for reading or other class-related activities (e.g. lecture slides, pdf documents of journal articles, evolution simulation software) are for your educational use and we ask that you do not purposely redistribute them on the internet.

## Lecture Schedule:

### Unit 1: Introduction to Evolution and Population Genetics

W January 21-Course overview, grading, introduction

M January 26-The Nature of Science and Evidence of Evolution

Text reading: Chapter 2

Dodzhansky\_1973.pdf

W January 28-Microevolution and macroevolution: same processes, different scales

(Perspectives on the evolution of humans and our closest relatives)

(Who are you calling a species?)

Text reading: Chapter 20

M February 2- If it's not heritable, evolution isn't happening

(Genes, genomes, and mutation – we'll get to epigenetics later)

Text reading: Chapter 5, 9

W February 4-The environment as a modifier - Genotype, phenotype, and variation

Simple and complex traits

Text reading: Chapter 5, 9

M February 9-What happens to variation once it arises? - Mutation, Selection and Drift

(Fitness, frequency and population size)

Text reading: Chapter 6, 7

W February 11-More on the theory and testing: population genetics of simple traits

Text reading: Chapter 6, 7

M February 16-Population structure and sex also matter: Migration, mating and recombination

Text reading: Chapter 7, 8

W February 18-Exam 1

Note: no discussion sessions on Thursday 2/19 or Friday 2/20

**Unit II – Evolution at different scales. Ultimate origins, molecular to organismal evolution, speciation and the diversity of life.**

M February 23- Molecular Evolution of genes and proteins. The Neutral Theory. Rates and patterns of changes in nucleotide and amino acid sequences  
Text reading: Chapter 4

W February 25- Molecular Evolution Continued: Rates and patterns of changes in nucleotide and amino acid sequences and genome-wide scans for selection

M March 2- Regulatory Evolution- the important consequences of variation in gene expression patterns within and between species  
Text reading:

W March 4- Developmental Evolution- variation in genes involved in developmental processes can dramatically change the form  
Text reading: Chapter 19

M March 9- Epigenetic Inheritance and Evolution  
Daxinger\_2012\_epigenetics.pdf

W March 11- From genomes to organisms  
Text reading: Chapter 15  
Montague\_2014\_cat\_genome.pdf

M March 16-From populations to species: The process of speciation  
Text reading: Chapter 16

W March 18- Origins of Life and theories of early evolution. Experimental and theoretical explanations for the initial emergence of life and evolution of ancient biological systems  
Text reading: Chapter 17

M March 23-Tree of Life –what phylogenetics tells us about the relationships among major divisions of living things  
Text reading:

W March 25-Exam 2  
Note: no discussion sessions on Thursday 3/26 or Friday 3/27

M March 30-Spring Break  
W April 1-Spring Break

**Unit III: Evolutionary interactions. Causes and consequences of evolution when genes, organisms, species, and populations interact with each other and their environments.**

M April 6- Coevolution

W April 8-Biogeography (Human Biogeography)

M April 13- Sexual Selection

Text reading: Chapter 11

W April 15- Life History and Fitness Components

Text readings-Chapter 13

M April 20- Domestication (Genome Evolution II – cats and dogs)

W April 22- Ecological and Conservation Genetics: Introgression and Inbreeding

M April 27- Experimental Evolution –Revealing evolutionary processes by manipulating organisms in the laboratory

W April 29-Evolution as a social weapon –Identifying the misconceptions, misuses and manipulation of ideas from biology and evolution

M May 4-Evolution education –How evolution is, was and should be taught in the classroom

W May 6- Applied Evolution –practical (and impractical?) uses of evolution in agriculture, medicine, biotechnology and the marketplace

Sunday May 10 2:45-4:45 -Exam 3