MWF 1:30-2:20; ARC 147

Office Hours – MW right after class or by appointment

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Course Website: http://mesh.biology.washington.edu/biol280-aut13/index.html

Username: biol280; Password: evolution

Summary Description

A New History of Life will attempt to present a novel view of how life began and diversified on Planet Earth. The course will be informed by a slew of new discoveries that, when integrated, provide a surprising and seemingly novel view of what has long been treated as a reasonably well-known saga – the origin of life on Earth and its subsequent evolution. But this history has, in recent years, undergone a radical transformation, even since the start of this new century, as the pace of new instrumentation, experimentation, and far better ways of sampling the fossil record has required those who study Deep Time to revise, and then revise again. In this course, the traditional, cornerstone fields of Geology, Biology, and Chemistry will collide with the nascent disciplines of Astrobiology and Geobiology to produce a surprising new chronology and pageant of Earth and its life – a story of the animate and inanimate at the same time interlocking, colliding, and mutually evolving.

Course Goals:

1. Provide an overall view of the history of life on Earth, including factors that led to its appearance and subsequent diversification, by demonstrating the fossil record
2. Create an appreciation of multi-disciplinarily and its power at problem solving.
3. Introduce new concepts in science to non- science majors, as well as directing science majors into particular topics of interest in evolution, Earth history, and Biology in general.
4. Provide readings from a variety of sources that should be critically examined, in the hopes of increasing skills in critical reading and reasoning.

Requirements of the student:

A. Before each class the student will read, and study the PowerPoint presentation to be given that day
B. Before each class the student will have completed the reading assignment, and be prepared to answer key questions concerning that reading.
C. Each student will know how to ask for help – and will ask for it if anything in the lectures or reading is unclear
D. Attend class everyday
E. Attend weekly quiz sections

Grading:

a. Midterm - 30% of grade
b. Final - 30% of grade
c. There will be semi-weekly quizzes – 20 % of grade
d. Participation in lab/quiz sections and clickers – 20% of grade

Reading: Gould, S.J. 1989. Wonderful Life (Norton); assigned pdfs or website readings; Darwin. On the origin of species ** responsible for the first two chapters

Optional but highly recommended DK publishing, Prehistoric Life: The Definitive Visual History of Life on Earth ISBN-13: 9780756655730 Roughly $20.00

-Tentative Schedule-

Date	Lecture Topic	Reading
9/25 – W	What is history, what is science?	http://plato.stanford.edu/entries/history/,Gould, 280-291, Prehistoric life (PL) 1-20
9/27 –F	Tools for studying Earth history: geologic time?	Reading 1: The modern theory of biological…. Gould 1 PL 2-44
9/30-M	Tools for studying Life's history: Principles of Evolution	Gould 2 PL 2-44
10/2 –W	What is life?	Gould 2 Reading 2: What is life
10/4 –F	Origin of life	Reading 3: Seven Pillars of Life Reading 4: Synthesizing life PL 48
10/7 –M	Stromatolites and time	Reading 5: Woese- On the evolution of cells,
10/9 –W	Continents and the Proterozoic	Reading 6: hydrothermal vents and the origin of life PL 50-54
10/11 –F	Cambrian explosion	Gould 2
10/14- M	Burgess Shale and causes of the Cambrian explosion	Reading 7 - Reading on Rare Earth Hypothesis
10/16 –W	Diversity through time enter the Ordovician	Gould 2 PL 64-79
10/18- F	Silurian and Devonian	
10/21- M	Rise of Amphibians and Ocean diversification	
10/23 – W	Lecture summary and test review	

10/25 –F	**Midterm**	
10/28-M	The rise of plants first 3.5 B- years	Reading 8: Astrobiology Gould 3
10/30-W	Rise of reptiles and the first mammals (Act 1)	Reading 9: Major events in the Evolution of land plants
11/1- F	The Permian mass extinction and the big 5 mass extinctions	Gould 3: PL80-92
11/4 –M	The rise of dinosaurs the Triassic	Gould 4, Start Darwin
11/6 –W	Dinosaurs Pt 2 and the evolution of flight	Gould 4 PL94-108
11/8 – F	Dinosaurs act 2 the rise of birds and the KT	PL140 – 169
11/11 – M	HOLIDAY – NO CLASS	Gould 5
11/13 – W	Finish dinosaurs and transition to the great diversification of plants	Reading 10: The end- Permian PL 170-182
11/15 –F	**Finish plants**	Reading 11: Historical Extinctions PL194 -279
11/18 –M	**Act 2 the rise of mammals**	Gould 5 PL280-357
11/20 –W	The ice ages and the third age of mammals	
11/22 –F	Humans	PL358-386
11/25 – M	Legacy Responses	
11/27 –W	Holiday	
11/29 –F	Holiday	TURKEY ETC
11/30 –F	Future of Evolution	Reading 13: The Anthropocene PL 440-479
12/2 –M	Rare Earth and the death of Earth	
12/4 –W	Rewinding the tape	Finish Darwin, TBD
12/6 –F	Summary / Review	Re read 1: The modern theory of biological evolution
12/9 –M	**FINAL 2:30-4:20**	

Quiz Section Syllabus:

Week	Topic	Summary:
Week 1	No Quiz Sections!	
Week 2 10-1	Scientific method/ geologic time scale	Students will learn the geologic time scale, how to identify stratigraphic layers and how to form and test hypotheses.
Week 3 10-8	Early earth – Quiz 1	Students will examine the early history of earth, its formation, location and the earliest forms of life. Students will examine micro algae, stromatolites and phytoplankton. *Quiz 1 will be on the geologic time scale*
Week 4 10-15	Cambrian explosion	Students will examine early fossils with special emphasizes on sponges, trilobites and other Burgess Shale fauna.
Week 5 10-22	Early large life	Students will examine fossils of early large animals, such as nautiluses and ammonites.
Week 6 10-29	NO quiz sections	
Week 7 11-5	Plants Field Trip CONFIRMED	Students will explore the green house and examine the different extant plant species available. Demonstrations will include the various plant groups (mosses, gymnosperms, angiosperms, etc) and of different morphologic features (seeds, fly traps, flowers, cacti's, etc.).
Week 8 11-12	Dinosaurs /Birds – Quiz 3	Students will explore dinosaur fossils and dissect a bird. Bird dissection will demonstrate the morphology of lung sacs and its respiration. *Quiz 3 will be on land life.*
Week 9 11-19	Mega Mammals and humans Field Trip CONFIRMED	Students will explore the diversification of mega mammals, ice age fauna and human evolution at the Burke Museum
Week 10 11-26	NO Quiz Sections	
Week 11 12-3	REVIEW and Quiz 4	*Quiz 4 will be the big 5 mass extinctions*