

INVERTEBRATE PALEONTOLOGY SYLLABUS FALL 2008

GEOLOGY 231a

Instructor: Sara Pruss

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Brief Description: Paleontology is the study of ancient life and environments through examination of the remains of fossil organisms. A better understanding of the record of past life, paleoenvironments, and climates also has significant implications for the future. Paleontology is a rich field of endeavor and very much an interdisciplinary subject, borrowing heavily from and contributing greatly to both geology and biology. Some goals of this class will be to 1) to gain an understanding of major events in the history of life, including mass extinctions and evolutionary innovations; 2) develop observational tools that allow one to use of fossils to interpret ancient environments; 3) ability to recognize and identify all of the major phyla of invertebrates; and 4) generate, synthesize, and interpret data; present data in a formal, professional presentation

Office Hours: Wednesday 12pm-1pm; Tuesday 11am-12pm; or by appointment

Reading Materials: The primary text for this course is:

Prothero, D.R., 2004, *Bringing Fossils to Life* (2nd edition): McGraw-Hill, 503 p.

Reading assignments listed on the syllabus are assigned from your text, *Bringing Fossils to Life*. Other scientific papers and readings will supplement the weekly text assignments. These materials will be downloadable from the course website (or I will distribute materials in class).

Web Resources:

A variety of web resources are available to help explain topics that will be covered in this class.

These websites include but are not limited to:

- UC-Berkeley Museum of Paleontology: www.ucmp.berkeley.edu --general information, including geologic time and major evolutionary events
- International Commission on Stratigraphy: <http://www.stratigraphy.org/> --the most updated information about divisions of geologic time (an on-going process!)
- University of South Carolina Sequence Stratigraphy tutorial: <http://strata.geol.sc.edu/> --a useful resource that explains how and why paleoenvironments change through time

Reminder:

There will be 1 **required** field trip associated with this class. The field trip is a **mandatory** weekend trip to New York State during the weekend of September 26th-28th.

Evaluation:

Graded material for this class includes quizzes, exams, a written class project summary and presentation. Active participation in both class and lab will also be factored into the final grade for the class. Absences will negatively affect the “active participation” aspect of your grade. **In order to reduce the penalty, I must be notified in advance if you have to miss any class and a valid excuse is required.** All efforts should be made to avoid missing labs, as they cannot be made up. Lab assignments are due one week from the lab, at the beginning of lab. One point is deducted for every day the assignment is late (labs are worth 10 points each, so these deductions add up fast). The final will be completed as a self-scheduled exam during Finals week and is cumulative.

Quizzes: 20% Midterm: 25% Labs: 10% Lab Exam: 5% Class Project: 15% Final: 25%

Date	Topics	Lab	Readings	Project
Fri Sept. 5	Overview of class and topics covered			
Mon. Sept. 8	What are fossils? How are they preserved?		Chpts. 1-2	
Wed Sept. 10	Diversity, Extinctions and Radiations	Preservation and Traces	Chpts. 3, 6, 18	
Fri Sept. 12	Evolutionary Innovation & Functional Morphology		Chpt. 7	
Mon. Sept. 15	Evolution: How does it happen?		Chpts. 4-5	
Wed. Sept. 17	Paleoenvironments I	Fossils, Environments and Biostratigraphy (Timescale Quiz)	Chpt. 10	
Fri. Sept. 19	Paleoenvironments II and Biostratigraphy		Chpt. 8	
Mon. Sept. 22	Paleoecology I: Ecology of the past			
Wed. Sept. 24	Paleoecology II	Introduction to Project/ Molluscs I: Bivalves		
Fri. Sept. 26	Introduction to major groups			
Sept. 26-28	*****FIELD TRIP*****			
Mon. Sep. 29	Proterozoic Life I			
Wed. Oct. 1	“Snowball Earth” and Proterozoic Life II	Molluscs II: Gastropods and Cephalopods	Chpt. 15	Begin counting shells
Fri. Oct 3.	Cambrian Explosion I: Fossil Lagerstätte			
Mon. Oct. 6	Quiz I			
Wed. Oct. 8	*****GSA No Class*****	Work on projects		Continue work on project
Fri. Oct. 10	Cambrian Explosion II: Cambrian fauna			
Mon. Oct. 11-14	*****Fall Break*****			
Wed. Oct. 15	Ordovician radiation I: Rise of skeletons	Arthropods (Trilobites)	Chpt. 14	
Fri. Oct. 17	Ordovician radiation II: Diversification-15			
Mon. Oct. 20	Paleozoic Life I: Plants			
Wed. Oct. 22	Paleozoic Life II: Benthic Communities	Echinoderms	Chpt. 16	Shell Excel plots due
Fri. Oct. 24	End-Permian extinction			
Mon. Oct. 27	Early Triassic recovery			
Wed. Oct. 29	Midterm	Brachiopods/Bryozoans	Chpt. 13	
Fri. Oct. 31	Mesozoic Life I: The Arms Race			
Mon. Nov. 3	Mesozoic Life II: Plankton and bivalves			
Wed. Nov. 5	Cretaceous life and K-T Extinction	Corals/sponges	Chpt. 12	Shell ID's and sizes due
Fri. Nov. 7	K-T extinction and			
Mon. Nov. 10	Cenozoic Recovery I: Forams			
Wed. Nov. 12	Cenozoic Life II: Microfossils	Micropaleontology	Chpt. 11	
Fri. Nov. 14	Paleocene-Eocene and carbon isotopes			
Mon. Nov. 17	Life and climate: Glacial/Interglacials			
Wed. Nov. 19	Current extinction	TBA		5 literature sources due
Fri. Nov. 21	Quiz 2			
Mon. Nov. 24	Ca/Mg ratios			
Wed. Nov. 26	*****Thanksgiving Break*****	NO LAB		
Fri. Nov. 28	*****Thanksgiving Break*****			
Mon. Dec. 1	Evolutionary trajectories			
Wed. Dec. 3	The Big 5 Extinctions	Review		
Fri. Dec. 5	Group presentations			Present data
Mon. Dec. 8	Group presentations			Present data
Wed. Dec. 10	Jeopardy & review/Project write-up due	Lab Exam		Project DUE!

*It is possible that the syllabus will change this semester as adjustments are made. You will be notified about any changes as they occur.
Dates of exams and field trips are fixed.