

Introduction to Time: T Th 10:40-11:55 AM
T 1:40-4:30 PM

Room: PSH 465

Instructor: Prof. Jack Farmer

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Office Hours: W, 2-4 PM and by appointment.

Textbook

Title: "Bringing Fossils to Life: An Introduction to Paleobiology" (Second Edition)

Author: Donald R. Prothero

Publisher: WCB/ McGraw-Hill (2003)

Course Objectives

In this course we will explore the fossil record and what it reveals about the history of life on our planet. The course will review basic biological and ecological principles, which form the primary conceptual framework for the fields of paleobiology and paleoecology. Our primary goal will be to understand long-term trends in the evolution of species and communities and the factors that have regulated biodiversity and extinction over geologic time scales at local, regional and planetary scales. An emphasis will be placed on understanding biological relationships and processes. This will generally be at the expense of detailed systematic (classification-based) treatments of fossil groups. Rather, we will become familiar with major fossilizable groups from the standpoint of the general relationships between form and function and the characteristics used to differentiate between the major phyla and classes of organisms. We will also highlight the primary ecological roles of these groups during the evolution of the biosphere, with a special interest in the origination, evolution and extinction of higher-level taxa and how these historical processes have shaped ecosystems on land and in the sea. Laboratory sessions and field trips will generally be coordinated with the major conceptual themes explored in lecture and will provide an opportunity for more direct, hands-on experience with various observational and analytical tools of paleobiology.

Course Format

The course format will include lectures, in-class discussions and exercises, occasional videos, a weekly lab section and 3 class field trips (two Saturday trips and one held during the lab period). Lectures will be designed to amplify the textbook reading and class handouts. Lectures will be presented using Powerpoint and will incorporate short video clips and hand samples. The lectures will be archived each week on a course website. Details for accessing the course website will be provided in class the first week. As noted above, the lab section on Tuesday afternoons will emphasize "hands on" demonstrations of the concepts reviewed in lecture. Some flexibility in the lecture schedule may be necessary to maintain a closer connection between lecture topics and lab demonstrations. This may result in some lecture material being presented during the lab period and some lab material carrying over into lecture.

Course Policies

Because of the highly integrative nature of the material covered in the course, regular attendance at lectures and labs is expected. Attendance will be monitored through participation in class exercises, homework and weekly quizzes. The history of attendance will be carefully considered when assigning final course grades.

The classroom is a place for learning. Talking in class, reading the newspaper, eating food, or other noisy activities are improper classroom behavior during lectures is distracting to others who have come to learn. In accordance with University policy, students who disrupt classroom activities will be asked to leave and if they persist, will be dropped from the course.

Exams and Grading

The lecture grade will be based on a midterm and final exam, plus weekly in-class quizzes and homework and lab/fieldtrip assignments. To earn extra credit, students are offered the opportunity to write a 12-page term paper (plus references and illustrations). The paper topic must be drawn from materials covered during the course and

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must be agreed upon by the instructor. Labs will consist of weekly exercises, a lab midterm and a lab final. Final exams will emphasize the latter half of the class, but will include questions that cover recurrent themes from the first half of the course. Exams will be closed book and include short answer essay, fill-ins and matching questions. The approximate point breakdown for the course is given below:

Midterm 1	100 points
Course Final	150 points
In-Class Quizzes, Exercises	150 points
Lab Exercises	150 points
Lab Midterm and Final	150 points
Fieldtrips and Field Exercises	100 points
Total points for the course	800 points
Optional extra credit paper/project	75 points

No early or make-up examinations will be given, except for medical reasons, or attendance at an official ASU-sanctioned sporting event. In all cases there must be official written documentation by a doctor or University Official before permission for a make-up exam will be granted. Make-up exams are typically oral exams that last an hour.

The College of Liberal Arts and Sciences has mandated that final exams be given and taken at assigned times. As a matter of University policy, requests for early final examinations will not be granted by the instructor.

Students found cheating on exams will be assigned a failing grade for the course.

<p>Tuesday August 22 Lecture: Paleontology as a science (Chap. 1: 4-8). Exopaleontology: Lab: Fossil preservation (Chap. 1: 8-18);</p>	<p>Thursday August 24 Lecture: Biological information encoded in skeletons (Chap. 2). (Drop-add deadline is today)</p>
<p>August 29 Lecture: Morphological variation in plants and animals (Chap. 2). In-class exercise: Types of skeletons Lab: Assessing variation in fossil populations</p>	<p>August 31 (Quiz on Chaps. 1 and 2). Lecture: Species and Speciation (Chap. 3).</p>
<p>September 5 Lecture: Speciation (Continued; Chap. 3) Lab: Skeletal growth and locomotion in animals</p>	<p>September 7 (Quiz on Chap. 3: Species) Lecture: Species, evolution and the fossil record (Chap. 3)</p>
<p>September 12 Lecture: Species, evolution and the fossil record Lab: Evolution and the fossil record (Chap. 3)</p>	<p>September 14 (Quiz on Chap. 3: Evolution) Lecture: Classifying living things (Chap. 4)</p>
<p>September 19 Lecture: Microbial biofilms, mats and stromatolites Lab: Classification (Chap. 4)</p>	<p>September 21 (Quiz on Chaps. 4). Lecture: Phyla - Porifera (sponges) and Archaeocyatha (Chap. 12)</p>
<p>September 26 Lecture: Introduction to the Phylum Cnidaria (Chap. 12) Lab: Porifera, Archaeocyatha and Cnidaria</p>	<p>September 28 (Quiz on Chap. 12). (Lab carry over) Lecture: Lophophorates - Phoronids and Brachiopods (Chap. 13)</p>
<p>October 3 Quiz: Geologic Time Scale Lecture: Lophophorates - Bryozoans (Chap. 13) Lab: Form and function in living and fossil lophophorates (Chap. 13)</p>	<p>October 5 (Quiz on Chaps. 13). Lecture: Lophophorates - Bryozoans (Chap. 13) Saturday, Oct. 7: Fieldtrip to Payson area.</p>
<p>October 10 (Lecture review, Monday, October 9, 2 PM) Lecture Midterm (Lab review session: Wednesday, Oct. 11, 10AM to 1PM)</p>	<p>October 12 Lab Midterm</p>
<p>October 17 Lecture: Arthropods: Trilobites, Chelicerates, Crustaceans and Insects (Chap. 14). Lab: Using fossils to date the Naco Fm. & Phylum Arthropoda (Chap. 14)</p>	<p>October 19 (Quiz on Chap. 14). Lecture: Arthropods: Trilobites, Chelicerates, Crustaceans and Insects (Chap. 14).</p>
<p>October 24 No class this week. Geological Society of America National meeting, Salt Lake City</p>	<p>October 26 No class this week. Geological Society of America National meeting, Salt Lake City</p>
<p>October 31 Lecture: Mollusca - Clams, snails, cephalopods, scaphopods and chitons Lab: Phylum Mollusca (Chap. 15)</p>	<p>November 2 (Quiz on Chap. 15). Lecture: Biostratigraphy</p>
<p>November 7 Lecture: Survey of invertebrate phyla: Echinodermata: Asteroids (starfish) and urchins (Chap. 16 and class handouts). Lab: Phylum Echinodermata</p>	<p>November 9 (Quiz on Chap. 16) Lecture: Trace Fossils (Chap. 18)</p>
<p>November 14 Lecture: Origin and evolution of early vertebrates. (Chap. 17) Lab: Trace fossils (Chap. 18)</p>	<p>November 16 (Quiz on Chap. 18) Lecture: Origin of the tetrapods (Chap. 17) Saturday Nov. 18: Field trip to Tuscon area</p>
<p>November 21 Lecture: Origin of the tetrapods (Chap. 17) Lab: Functional morphology of the vertebrate skull</p>	<p>November 23 <i>Thanksgiving Break - No class</i></p>
<p>November 28 Course evaluations Lecture: Dinosaurs (Chap. 17)</p>	<p>November 30 (Quiz on Chap. 17: Tetrapods and the transition to land). Lecture: Origin and evolution of mammals</p>

<p>Lab: <i>Field trip to Mesa Museum</i></p>	<p>(Chap. 17)</p> <p><i>Afternoon: Lab review: 2-4 PM PSH 465</i></p>
<p>December 5 (Quiz: Chapter 17: Dinosaurs) Lecture: Extinction (Chap. 6) Lab final exam, 1:40-4:15, PSH 465</p>	<p>December 7 No class (finals week)</p>
<p>Friday, December 8 Lecture Final: 10:00-11:50 AM, PSH 465</p>	<p>Have a great Holiday season!</p>

Field trip schedule:

Saturday, Oct. 7: Fieldtrip to upper Paleozoic marine and fluvial sequences near Payson, AZ.

Saturday, Nov. 18: Field trip to Pleistocene fluvial and lacustrine sequences, west of Tuscon, AZ.

Tuesday, Nov. 28: Behind the scenes tour of the Mesa Museum (held during lab period).