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<h1>Syllabus, fall 2007</h1> <h4>GE 330: Paleontology</h4>
<p>Lecturer: Prof. Paul Strother

Teaching Assistant: M. Baldwin

Office: 313 Devlin

Office Hours: 1:00 to 2:30 pm Tuesday/Thursday or by appointment.

tel: 2-3460 (Devlin Office) or 2-8395 (Weston Office)

email: strother@bc.edu . Please include
GE330 in the subject line of your email correspondence</p>

<h4>Lecture Schedule</h4>

<p>September 4 Introduction to Paleontology and Paleobiology. Course
Introduction and logistics. Paleontology as a dating tool in service to
Geology. The disciplines that make up Paleontology. What is Paleobiology?
Paleontology and macroevolutionary theory.</p>

<H3>Geology and Paleontology</H3>

<p>September 6 The Rock Cycle. The rock cycle is an easy but powerful
way for looking at the Earth, especially in its dynamic context.
Uniformitarianism, a basic approach to studying past events, is discussed in
its historical context.</p>

<p>September 11 Paleontology and the beginnings of historical
geology.<I>The Meaning of Fossils</I>: Steno to Darwin. Cuvier and the
notion of extinction. The beginnings of biostratigraphy.</p>

<p>September 13 Taphonomy. A look at the process of fossilization and
the materials that constitute fossils.</p>

<p>September 18 Geochronology . The development of the geological
timescale and its dependence upon Paleontology. Index fossils, biozones, modern
biostratigraphy.</p>

<p>September 20 Ichnology: the study of trace fossils This is in active
and important area of current research in the Paleoecology.</p>

<p>September 25 Sequence Stratigraphy. Stratigraphy is the practical science concerned with the development and use this relative timescale. [Galli lecture] </p>

<p>September 27 QUIZ #1.

<H3>History of Life on Earth</H3>

<p>October 2 PreCambrian Paleobiology I. When did life originate on Earth? This lecture reviews the current state of affairs on the evidence for life in the Archaean Aeon, 4.0 to 2.5 billion years ago. </p>

<p> October 4 PreCambrian Paleobiology II. Proterozoic Paleobiology encompasses the record after 2.5 Ga and includes the first indisputable records of Precambrian life. </p>

<p> October 5-8 Class Field Trip. Plan to leave Friday to travel to Nova Scotia. Saturday we visit the Carboniferous section at Joggins, a classic site visited by Lyell in the 1840's. Five Islands and Economy point for tital habitats and sedimentation on Sunday and then on to Mississippian trackways at Horton Bluff.</p>

<p>October 9 PreCambrian Paleobiology III. The Ediacaran System is the latest addition to the Geological Timescale, encompassing the very end of the Precambrian. This is a fascinating era of strange but large creatures that mimic some animal forms but are clearly different from any animals seen to day.</p>

<p>October 11 The Cambrian revolution. The Cambrian Period saw the establishment of most of the animal phyla and set the stage for the subsequent evolution of most eukaryote life on Earth.</p>

<p>October 16 Life in the Early Paleozoic. Life in the eperic oceans. The first Paleozoic glaciation. Origin and development of reefs. The Paleozoic fauna and invertebrate diversity. Continental drift.</p>

<p>October 18. Midterm Examination</p>

<p>October 23 Early life on land. Origin of plants and the transition of life from onto dry land. The early tracheophytes - The Rhynie chert. The origin of trees (Gilboa forest) and the great swamps of the Carboniferous. Pangea.</p>

<p> October 25 Vertebrate Evolution I. Vertebrate origins. Jawless fishes. The early amphibians. Some classic vertebrate morphology. Analogy and homology in evolution.

<p> October 30 Vertebrate Evolution II. Dinosaurs, birds and all that. </p>

<p>November 1 Mesozoic Life.Triassic/Jurassic Basins of the north east and "astro" stratigraphy. </p>

<p>November 6 Origin of Angiosperms. A mystery that eluded Darwin himself is introduced (along with some basic Paleobotany).</p>

<p>November 8 The Tertiary System John Phillips, William Smith & Lyell. Tertiary deposits in Central North America. Oxygen isotopes and sea water temperatures. </p>

<p>November 13 QUIZ #2
The Pleistocene Fossils of the Ice Age are reviewed and discussed in the light of climatic change models.</p>

<H3>Paleobiology</H3>

<p>November 15 Diversity Curves. This is an aspect of Paleobiology that is concerned with large-scale trends (macroevolution) in groups of organisms through time. Extinction has been widely studied over the past 20 years and most paleontologists now consider this an important component of the evolutionary process on Earth.</p>

<p>November 20 Molecular Paleontology. We look at the increasingly important role played by biomarkers and the chemistry of fossilized organic matter. </p>

<p>November 22 Thanksgiving Holiday</p>

<p>November 27 Marine Ecosystems through Time. This lecture examines the rather new notion that ocean chemistry has changed through time and how this has affected Earth systems and the evolution of marine ecosystems. </p>

<p>November 29 Introduction to Paleoclimatology. Changes in O₂ and CO₂ throughout Earth history have had (and are having) profound effects on all life on Earth. We review the geological evidence that documents these changes over time and discuss the impact they have had on evolution of life and Earth systems.</p>

<p>December 4 Paleontology and Evolution. Major features of evolution that are manifest through the study of the fossil record. Origins at the kingdom level.</p>

<p>December 6 The Gaia Hypothesis. The evolution of life on earth is an intimate interplay between environmental factors and biological one. This lecture is a brief glimpse into the concepts that concern this aspect of Earth systems and paleontology. Course Review.</p>

<p>Thursday December 13 Final Exam, 9 am.</p>

<h4>Assignments and Particulars</h4>

<p>Office Hours: 1-2:30 pm Tuesdays/Thursdays or by appointment (phone 2-8395).</p>

<p>Email: strother@bc.edu, please use "GE330" in the subject heading of any course-related email.</p>

<p>Textbook: <I> Palaeobiology II</I> by Briggs and Crowther. (eds.) Any additional reading assignments will be announced in class.</p>

<h4>Grading and Exams</h4>

<p>Grading for the course will be broken down as follows:</p>

- Quizzes (2) 20%
- Midterm 20%
- Lab 35%
- Final Exam 25%

<p>All exams are "open notes" examinations. This means that you are allowed to use class notes (or other notes handwritten by you only) during the exams. No copies of printed material are permitted. I do this to encourage everyone to take good notes, both in class and in reviewing and summarizing written work. </p>

<p class=update>A pdf version of this document is found at, ww2.bc.edu/~strother/GE330/syllabus330.pdf.</p>

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