GEOL 220 EARTH HISTORY SPRING, 2009
AND THE FOSSIL RECORD

Geologists, in their all but closed conversation, inhabit scenes that no one ever saw, scenes of global sweep, gone and gone again, including seas, mountains, rivers, forests, and archipelagoes of aching beauty rising in volcanic violence to settle down quietly and then forever disappear - almost disappear.

John McPhee

Dr. James R. Ebert
Office: Science I, Rm. 209A Office hours: M 1:00, T 11:00, Th 1:00 and by appointment
Office phone: x3065 E-mail: Ebertjr@oneonta.edu
Class meets: Science I, Room 211; M, W, F 2:00, Lab is M 3:00 - 4:50 or W 3:00 - 4:50

College Catalog Description of Course: Techniques of interpreting geologic history; detailed account of eras of earth history and changes in life through time. Laboratory and field exercises illustrate techniques and geologic history. Offered Spring Semester. Prerequisite: Any 100 level Geology course.

Attributes for General Education: LA, NL, CW

Course goals and activities: This course is designed to provide students with an overview of Earth's history and an understanding of the techniques that are used to read and reconstruct that history. Aspects of the physical and biological development of the Earth over 4.6 billion years will be examined in class. Techniques for reading and interpreting Earth history will be explored in laboratory activities. Field exercises will provide opportunities for students to employ the skills that they have developed through previous lab activities.

TEXT:

Stanley, S.M., 2005, Earth System History, 2nd Edition, NY, W. H. Freeman and Company, 567p.

Compton, R.R., 1985, Geology in the Field: New York, NY, John Wiley and Sons, Inc., 398p. (Recommended for lab and field projects.)

GRADING AND ASSIGNMENTS

You are expected to have assignments read before attending lecture and lab. This will better prepare you for class and help to enable you to ask intelligent and informed questions. ***Attendance for labs and field trips is mandatory.***

Participation and Professionalism will be evaluated. Attendance is essential and may affect your grade.

Your grade will be determined as follows:

Labs and In-Class Activities:	35%
Mega-Labs (2)	15%
Field trip report - Depositional Environments	8%
Field trip report – Stratigraphy	12%
Field trip report – The Big Picture	15%
Midterm and final exams	10%
Participation and Professionalism	5%
TOTAL:	**100%**

FIELD TRIPS

Three **REQUIRED FIELD TRIPS** are scheduled for April 20 or 22, depending on which day you have lab **and two all-day trips on SATURDAY, April 26 and May 2.** We will tour some of the fabulous geology of eastern New York State and you will have opportunities to demonstrate all you've learned in the course!

SCHEDULE OF LECTURES AND LABS		
Date	**Topic**	**Readings**
1/14	Introduction, The Denudation Dilemma, Deep Time and the Science of Geology	
1/16	**Clues in the Rocks: Basic Rock Types – Textures, Processes of Formation, Recycling**	
Lab 1	**Clues in the Rocks: Siliciclastic Sediments and Rocks**	
1/19	**Clues in the Rocks: Geologic Structures and Relative Age Relationships**	Ch. 3
1/21	**Clues in the Rocks: Geologic Structures and Relative Age Relationships**	
1/23	Evolution, Bioevents and the Fossil Record	Ch. 3,6,7
Lab 2	**Clues in the Rocks: Preservation of Fossils; Major Groups of Invertebrate Fossils**	Introduction to paleontology Ch. 4
1/26	Principles of biostratigraphy and building a Geologic Time Scale	Ch. 3,6,7
1/28	Origin of the Earth**,** the oldest rocks on Earth & calibrating geologic time	Ch. 3,6,11
1/30	A World before abundant Fossils: Precambrian Primer	Ch. 13
Lab 3	**Clues in the Rocks: Paleoecology of Fossils**	Principles of Paleoecology
2/2	Origin and early history of life	Ch. 11
2/4	Konservat Lägerstatten: an introduction; Ediacarans and the Small Shelly Fauna	Ch. 12, 5
2/6	A long slow fuse and the Cambrian Explosion: insights from Mid-Cambrian Lägerstatten	Ch. 13
Lab 4	**Clues in the Rocks: Introduction to Carbonate Sediments**	
2/9	Rodinia, Rifting, Iapetus, the Great American Bank and Epicontinental/Epeiric Seas	Ch. 11,12,13
2/11	Case Study in Sedimentary Tectonics: Taconic Orogeny	Ch. 13
2/13	Case Study in Sedimentary Tectonics: Taconic Orogeny	Ch. 13
Lab 5	**Clues in the Rocks: Sedimentary Structures**	Ch. 5
2/16	Facies, Facies Patterns and Depositional Environments	
2/18	The Calm Between Storms: Siluro-Devonian Epeiric Seas	Ch. 14,6
2/20	The Acadian Orogeny and the Catskill Clastic Wedge	Ch. 14
No Classes		
Lab 6	**Clues in the Rocks: Facies Patterns – Mega-Lab**	
3/2	Colonial history of terrestrial environments and a Devonian amphibious assault	Ch. 14
3/4	Alleghanian Orogeny, cyclothems and coal swamps	Ch. 15
3/6	Pangea and the Great Dying: the Terminal Permian Extinction	Ch. 15
Lab 7	**Clues in the Rocks: Carbonate Rocks**	
3/9	Case Study in Sedimentary Tectonics: Mesozoic rifting and the East Coast	Ch. 16
3/11	**Exam I**	
3/13	Mesozoic Marine Communities	
Lab 8	**Clues in the Rocks: Comparing Geologic Histories – Correlation**	
3/16	Mesozoic terrestrial life: reptiles, dinosaurs and the dawn of mammals, Dinosaur KWL	Ch. 16,17
3/18	Mesozoic terrestrial life: dinosaurs – from your questions	Ch. 16,17
3/20	Mesozoic Highlights: Sölnhofen and Morrison Lägerstatten & the K-T boundary event	Ch. 16,17
3/22-24	**No Class on Monday: Northeast GSA Conference – Portland, Maine**	
Lab 9 Monday Schedule	**Clues in the Rocks: Regional Patterns from Geologic Maps**	
3/25	GSA Debriefing; Cenozoic Life: The Morning After	Ch. 18
3/27	Cenozoic Life: Buried in Ash	Ch. 19
Lab 10	**Clues in the Rocks: Stable Isotopes and Paleoclimates – Mega-Lab**	Ch. 19
3/30	Paleoclimate Indicators and Temperature Proxies	
4/1	Paleoclimates	
4/3	Paleoclimates	
No Classes		

SCHEDULE OF LECTURES AND LABS		
Date	**Topic**	**Readings**
W: Lab 9	**Clues in the Rocks: Regional Patterns from Geologic Maps**	
4/15	**Paleoclimates Lab Due**; Discussion; Cenozoic Climate Change: A Story of Instability?	Ch. 19
4/17	Cenozoic Climate Change: A Story of Instability?	Ch. 19
Field	**FIELD TRIP (2:00 – 5:00): Depositional Environments**	
4/20	**Silver Creek Field Trip – Monday Lab Only**	
4/22	**Silver Creek Field Trip – Wednesday Lab Only**	
4/24	Fossils and Biostratigraphy from Silver Creek (Bring your fossils!!) Meet in Lab – 204.	
4/26	**SATURDAY FIELD TRIP - Stratigraphy**	
Field	**Sample Description, Analysis and Preparation of Field Trip Reports**	
4/27	Discussion of Silver Creek Field Trip	
4/29	The Pleistocene and Holocene History of New York State	
5/1	Cenozoic Life: primates and early hominids	Ch. 19
5/2	**SATURDAY FIELD TRIP – The Big Picture**	
5/4	Cenozoic Life: primates and early hominids	Ch. 19
5/6	**Discussion of Saturday Field Trip; FIELD TRIP REPORTS DUE** Deep Time and the Present Time	
5/8	**Exam II: 11:00 – 1:30**	

"If by some fiat, I had to restrict all this writing to a single sentence, this is the one I would choose: The summit of Mount Everest is made of marine limestone."

John McPhee