

## *Geology 27: PALEONTOLOGY*

**LECTURE:** Mon/Wed/Fri 11:00-11:50 am (ESNH 211)

**LAB:** Thurs 1-4 pm (ESNH 211)

**FACULTY:** Whitey Hagadorn (ph: 2714; email: jwhagadorn; office: ESNH 312)  
*Office Hours:* Mon/Wed/Fri 10-11 am, and by appointment

**TEXT:**

- 1) Prothero, D. R., 2003, *Bringing Fossils to Life: An Introduction to Paleobiology*: McGraw-Hill, Boston, 2<sup>nd</sup> edition, 503 p. (avail. in Jeffery Amherst Bookstore). *Note:* The 1<sup>st</sup> edition of this text is not acceptable.
- 2) Various electronic readings – available on the course web site.

**COURSE OBJECTIVES:**

1. To better understand the richness of ancient life on Earth.
2. To be able to recognize, identify, and interpret fossils in the field and in the laboratory.
3. To be able to use fossils to solve problems, test hypotheses, and investigate Earth history.

**COURSE EXPECTATIONS:**

Participate in class and in lab – learn all you can with the specimens in our teaching and museum collections. Come to class. Read before you come to class, so you get the most out of lectures and labs. Complete written assignments on time; 10% off for every day assignments are late. Please see the attached Statement of Intellectual Responsibility.

**COURSE REQUIREMENTS:**

Quizzes: There will be Monday quizzes on that week's reading assignment.  
(10% of final grade)

Labs: Lab write-ups, including sketches and calculations, may be handwritten or typed and are due in the following week's lab. 10% is taken off for each day they are late.  
(50% of final grade)

Field Trips & Seminars: Two weekend field trips (to ME and NY) are an integral part of the course. Students should bring tunes for the van ride.  
(10% of final grade)

Exams: There will be three one-hour comprehensive exams, plus a lab practical exam.  
(30% of final grade)

## MISCELLANEOUS:

*MoPhos:* Please turn off your mobile phone and pager before class. If your mopho or pager goes off during lecture or lab, I will take it.

*Plagiarism/Cheating:* Violation of the SIR will result in failure of the course.

*Other:* If you have a special learning need or related characteristic that requires additional consideration, please let me know ahead of time.

*Labs:* Occasionally these will extend beyond the normal lab period, due to weather, traffic, or other unforeseen circumstances.

*Absences:* If you are sick or have a compelling reason to miss these assignments, please have the Dean email me and I will either allow you to make them up or omit the missed item(s) when calculating your final grade. Exception: If you miss a field trip, you will need to write a 10 page single-spaced term paper (excluding references and figures) on a topic of my choosing as a substitute.

*Extra Credit:* There will be occasional bonus questions on your exams. These questions will be based on material covered in seminars and field trips.

*GeoDept Access:* You will probably need to be in the building after hours to work on your labs and study for your exams – please see Jackie in the main office to obtain a key to the lab, and get your ID activated for building access. I will provide you with a key to the microscope cabinets.

DATE	LECTURE	TOPIC	READING (Prothero/Handout)
W Sep 3	1	Introduction: Custodians of Earth history	Handout – geologic time
<i>Th Sep 4</i>		<i>Lab 1: Sedimentary Rocks, Fossil Preservation, Techniques in Paleontology, Top 40</i>	
F Sep 5	2	The fossil record	1-20
M Sep 8	3	Ontogeny	21-30, 295-307
W Sep 10	4	Sponges and cnidarians	214-229
<i>Th Sep 11</i>		<i>Lab 2: Sponges, cnidarians</i>	
F Sep 12	5	Populations and variation	30-37
M Sep 15	6	Species and speciation	39-45, 65-79
W Sep 17	7	Echinoderms	318-341
<i>Th Sep 18</i>		<i>Lab 3: Echinoderms (pelmatazoans, eleutherozoans)</i>	
F Sep 19	8	Systematics	46-63
<i>F-Sun Sep 19-21</i>		<i>***Darling Marine Lab Field Trip*** Van leaves Fri eve., rtrns late Sun night</i>	
M Sep 22	9	Functional morphology	96-117
W Sep 24	10	Lophophorates	230-251
<i>Th Sep 25</i>		<i>Lab 4: Brachiopods, bryozoans</i>	
F Sep 26	11	Tempo and mode of evolution	Eldredge & Gould (1972, 1975)
<i>S-S Sep 27-28</i>		<i>***New York Field Trip*** Van leaves Sat a.m.; returns late Sun night</i>	
M Sep 29	12	Paleoecology I	118-135
W Oct 1	13	Paleoecology II	135-148
<i>Th Oct 2</i>		<i>Lab 5: What is a species? (Arcidae)</i>	
F Oct 3	14	Paleoecology III	
M Oct 6		<b>Exam I</b> (covers lectures 1-14 and labs 1-5)	
W Oct 8	15	Video: Shape of Life – Survival game	281-294, 307-317
<i>Th Oct 9</i>		<i>Lab 6: Molluscs (bivalves, gastropods, cephs)</i>	Ballarini & Heuer (2007)
F Oct 10	16	Paleocommunities, eustasy, tectonics	McKerrow & Cocks (1976) ; addl. figs.
W Oct 15	17	Protists, prokaryotes, and friends	188-213
<i>Th Oct 16</i>		<i>Lab 7: Micropaleontology, Biostratigraphy</i>	
F Oct 17	18	Biogeography	149-167

M Oct 20	19	Arthropods I	252-279
W Oct 22	20	Arthropods II	Fortey (2004); Fountain (2004)
<i>Th Oct 23</i> <i>Th Oct 23</i>		<i>Lab 8: Arthropods</i> <i>Dr. Kirk Johnson ('82) "Crocodiles in Greenland and Hippos in London", Rm 107, 8 pm</i>	
F Oct 24	21	Biostratigraphy	168-185
M Oct 27	22	Taphonomy	Martin (1999a); Schmidt & Dilcher (2007)
W Oct 29	23	Trace fossils	419-433
<i>Th Oct 30</i>		<i>Lab 9: Trace fossils (Trackways)</i>	DVD: Volcanos of the Deep Sea
F Oct 31	24	Lagerstätten	Martin (1999b)
M Nov 3	25	Archean life	Buick (2001)
W Nov 5	26	Chordates I: Fish 342-373	
<i>Th Nov 6</i>		<i>Lab 10: Fish</i>	
F Nov 7	27	Proterozoic and earlier life	Knoll & Xiao (2001); Wright (1997)
F Nov 7		<b>Exam II</b> (covers lectures 15-27 and labs 6-10)	
M Nov 10	28	Snowball Earth I	Hoffman & Schrag (2000)
W Nov 12	29	Chordates II: Amphibians, reptiles, archosaurs, birds	373-394
<i>Th Nov 13</i>		<i>Lab 11: Dinosaurs &amp; their kin</i>	Shipman (2006)
F Nov 14	30	Snowball Earth II	TBA
M Nov 17	31	The Cambrian explosion	Erwin et al. (1997); Lessem (1993)
W Nov 19	32	Chordates III: Synapsids	394-417
<i>Th Nov 20</i>		<i>Lab 12: Mammals (locomotion)</i>	
F Nov 21	33	Extinction I	80-95
M Dec 1	34	Extinction II: Mass Extinctions	Sepkoski (2001); Erwin (2001)
W Dec 3	35	Plants, pollen	435-462
<i>Th Dec 4</i>		<i>Lab 13: Plants, pollen</i>	
F Dec 5	36	K/T extinction event	Hallam & Wignall (1997); Fastovsky & Sheehan (2005)
M Dec 8	37	How structured is the fossil record?	Ausich & Bottjer (1991); addl. figs.
W Dec 10		Ancient life on other planets	
F Dec 12, 7-9 pm		***Lab Practical Exam and Dinner***	
F Dec 19		<b>Exam III due</b> (comprehensive)	

# Statement of Intellectual Responsibility

## Preamble

Every person's education is the product of his or her own intellectual effort and participation in a process of critical exchange. Amherst cannot educate those who are unwilling to submit their own work and ideas to critical assessment. Nor can it tolerate those who interfere with the participation of others in the critical process. Therefore, the College considers it a violation of the requirements of intellectual responsibility to submit work that is not one's own or otherwise to subvert the conditions under which academic work is performed by oneself or by others.

## Article I Student Responsibility

**Section 1.** In undertaking studies at Amherst College every student agrees to abide by the above statement.

**Section 2.** Students shall receive a copy of the Statement of Intellectual Responsibility with their initial course schedule at the beginning of each semester. It is the responsibility of each student to read and understand this Statement and to inquire as to its implications in his or her specific courses.

**Section 3.** Orderly and honorable conduct of examinations is the individual and collective responsibility of the students concerned in accordance with the above Statement and Article II, Section 3, below.

## Article II Faculty Responsibility

**Section 1.** Promotion of the aims of the Statement of Intellectual Responsibility is a general responsibility of the Faculty.

**Section 2.** Every member of the Faculty has a specific responsibility to explain the implications of the statement for each of his or her courses, including a specification of the conditions under which academic work in those courses is to be performed. At the beginning of each semester all members of the Faculty will receive with their initial class lists a copy of the Statement of Intellectual Responsibility and a reminder of their duty to explain its implications in each course.

**Section 3.** Examinations shall not be proctored unless an instructor judges that the integrity of the assessment process is clearly threatened. An instructor may be present at examinations at appropriate times to answer questions.

*For further information regarding academic honesty and plagiarism, students are suggested to visit <http://www.amherst.edu/~dos/plagiarism/index.html>*