

Geoscience 290 Paleontology

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Course goals: The goal of this course is to give you an overview of the kinds of questions we ask using the fossil record and the types of data and methods we apply to these questions. We will examine the fossil record from biological and geological perspectives and explore the contributions fossils can make to a variety of other disciplines, including evolution, paleoclimatology, paleoenvironmental reconstruction, resource exploration, and geology.

Writing: Writing well, expressing thoughts clearly and cogently, and arguing persuasively are hallmarks of all educated people. Writing is a necessary part of geology and, in fact, any science. Refining your writing skills is important; therefore, short essays are an integral part of the course.

Texts:

(1) *Bringing Fossils to Life*, 2nd Edition, by Donald R. Prothero

Also required: Quad ruled notebook to be used for quizzes, labs, and fieldwork. You will also need a pencil, eraser, and colored pencils for drawing. Some labs require a calculator.

Evaluation: You will earn your grade in the following way:

In-lecture quizzes – 84 points. Daily quizzes are worth two points each. You will not receive extra time for quizzes if you are late to class.

Labs – 130 points. There are 13 laboratory exercises worth ten points each. Lab attendance is mandatory; missing more than one lab is grounds for failure. There is a 10 point penalty for missing a lab, in addition to the missed points of the lab itself. (In other words, it's - 20 points for missing a lab.)

Reading Discussions – 30 points. We will hold three discussions revolving around a particular topic. Each student will be responsible for an article from the primary literature.

Essays – 40 points. We will use the process of writing as a tool for understanding some of the concepts that we investigate.

Lab Practical – 30 points. The final lab period will be a lab practical exam.

Final – 100 points. The final, a take-home exam, will be your chance to show you can integrate what you've learned throughout the semester. The exam will consist of essay

questions that will require some research and some analysis. We will meet during the scheduled final exam period where you'll present and discuss your answers.

Field Trips – 20 points. We will take two mandatory one-day weekend field trips. You can earn up to 10 points for each trip and its write-up.

A Gift For You... – I will spot everyone 10 points at the beginning of the semester – enough to cover 5 botched quizzes.

Grades will be assigned as follows.

A+	A	A-	B+	B	B-	C+	C	C-	D	F
434-425	424-408	407-391	390-378	377-365	364-347	346-334	333-317	316-304	303-260	259-0

Readings: Readings are assigned for most lectures. Additional readings from the primary literature will be added where appropriate. You are responsible for all material in the assigned readings. You may, for example, be quizzed on reading material in lecture on the day after it is assigned.

Blackboard Site: The course will be administered through the Colleges' Blackboard server. Assignments, lab materials, and course information will be accessed through our course Blackboard site. Let me know if you're not listed in the course. Please check the Blackboard site regularly for assignments, announcements and other important information. **You are responsible for ALL information communicated through the Blackboard site.** If you regularly have trouble accessing Blackboard, contact IT to solve the problem before you miss an assignment. You should also sign in to Blackboard using the e-mail that you check most often. E-mail is a useful way to circulate reminders and we will use it often this semester.

Late Work: All assignments are due on the **day and time** announced. Late work will be accepted on the due date, but after the stated time with a 50% percent grade penalty. Late work will not be accepted after midnight on the due date. Exceptions to this policy may be considered only under extenuating circumstances and when the matter is discussed with me *before* the deadline. Computer or printer failures are *never* grounds for deadline extensions. Students arriving late to lecture will not be allowed extra time for quizzes. Student-athletes and others who miss class for extra-curricular activities must plan to hand in assignments before the due date to receive credit. Please review the deadlines for assignments now so that you can bring any conflicts to my attention immediately. Problems are much easier to solve before the deadline has passed. Work may always be handed in early to avoid a deadline conflict.

Attendance: Attendance in laboratory is mandatory. Missing more than one lab will result in a failing grade for the course, regardless of other work in the course. Attendance on the two weekend field trips is also required. Missing a field trip will result in a failing grade, regardless of other work in the course. Attendance in lecture is not required but strongly suggested. You are responsible for all material, assignments and announcements made during lecture. Please come on time.

Academic Honesty: I expect the highest standards of academic honesty from you in this course. You are expected to do your own work on all individual assignments. (1) Plagiarism (using someone else's words or ideas without giving the author appropriate credit) and (2) representing someone else's coursework as your own will not be tolerated. Violation of this trust will result in a zero for the assignment and referral to the Dean, your coach (if you are a student-athlete), and the Committee on Standards.

Personal Extra-Credit: It is important to be fair to everyone; I cannot offer an opportunity to one student that I do not offer to all. Consequently, no personal extra credit will be considered under any circumstances. If you feel that you are not making the grade you need or want, please talk me as *soon as possible* so that I can help you get back on track. There may be general opportunities for extra credit; you'll be advised if and when.

Class expectations:

- We will begin and end class on time; please don't come late.
- This should be implicit, but I'm going to make it explicit. You are expected to read all assignments and follow the directions. ***If you don't follow directions, you will not earn a top grade.*** For example, if the instructions require you to name a file in a particular way, do so.
- Everyone is expected to turn off cell phones, blackberries, and the like. Making calls, texting, browsing the web, *etc.*, *etc.*, during class is rude and disruptive. Anyone disrupting class this way must leave immediately.

Common-Sense Tips on How to Succeed in this Course

- Attend and participate — Come to lecture. Although lecture attendance is not required, there is a lot of material that we will discuss in lecture that is not in your text. Moreover, you earn points for in-class activities. Some students take in-class work lightly because it is only worth a few points at a time. However, they often make the difference between success and failure. Beyond attendance, be active! Ask questions in lecture, come to office hours, and participate in discussion.
- Ask questions — If assignments do not seem clear, if something in lecture or readings doesn't make sense, ask a question. If you are confused, chances are others are too. Even if you are not sure exactly what question to ask, ask something. However, if you're asking questions because you're not paying attention, start paying attention, and then ask.
- Make time – Make time for the readings, especially reading assignments from the primary literature. It takes time and repeated reading to understand the literature, particularly if the content is unfamiliar.

- Plan ahead — Most of the out-of-class assignments will require some research and a bit of thought. In other words, you will probably not succeed writing them at 5 a.m. on the morning they are due. Start work on out-of-class assignments early and work on them in small bites to get the most out of your time. Try to complete your assignment a day ahead of time so that you can put it away and return to it fresh for one final edit and proofread.

- PROOFREAD your work.

- Write well and rewrite better — In all of your written work, clear, concise, well-written prose is essential to success. We will work on organization and editing skills to help you improve, but you should be prepared to put as much time into re-writing as you did on the initial draft.

Mo	day	Class	Topics	Reading	Assign	Labs
Jan	19	1	Introduction / What is paleontology?	4-19		
	21	2	How do fossils form?	"	Mnemonic	Scientific drawing
	23	3	Taphonomy & How good is record?	"		
	26	4	Tree of life	188-213		
	28	5	Life in the colonies: Sponges, Cnidarians, Bryozoans	215-229, 231, 245-251		Marine Invertebrates
	30	6	Leaves at paleoclimate estimators	articles		
Feb	2	7	Darwin, Natural Selection, and Evolution	64-79	Essay 1	
	4	8	Mix 'n Match - Arthropods and Echinoderms	252-279, 318-341		Marine Invertebrates
	6	9	Discussion: selection	articles		
	9	10	Shell game: parametric variation in mollusk shells	251-294, 307-318		
	11	11	Ships that pass in the night: Brachs and Bivalves	231-244, 295-306		Marine Invertebrates
	13	12	Variation	20-37	Essay 2	
	16	13	Speciation	39-45		
	18	14	Phylogenetics & Systematics	47-63		Phylogeny
	20	15	Asking questions with cladograms	"		
	23	16	Fossil contributions			
	25	17	Seeds of Change: Land plant history	435-456		Palynology
	27	18	Discussion: whales	articles		
Mar	2	19	Evolution from the fossil perspective			
	4	20	Tempo & mode	76-78		Palynology
	6	21	Saltando or Glissando?: Origins of modern phyla		Essay 3	
	9	22	Diversity through time	141-142		
	11	23	Form and function 1	103-117		Functional morphology
	13-20		Spring Break			
	23	24	Form and function 2	97-103		
	25	25	Plants vs. animals	457-461		Bug Creek
	27	26	Show some backbone: Vertebrates on land	345-417		
	30	27	Extinction	79-93		
Apr	1	28	Extinction			Bug Creek
	3	29	Biostratigraphy	169-170		
	6	30	Discussion: Paleocene dinos?	articles		
	8	31	Sampling & zonations	170-178		Biostratigraphy
	10	32	Time & events	179-182	Essay 4	
	11 Saturday		Field Trip			
	13	33	Correlation (exercise)			
	15	34	Biogeography 1	49-158		Fossilized behavior
	17	35	Biogeography 2	159-167		
	20	36	Paleoecology	117-122		
	22	37	Evolutionary paleoecology	143-146		Paleoecology
	24	38	Inferring ancient climates	130-135		
	26 Sunday		Field Trip			
	27	39	Resolution, precision, accuracy			
	29	40	TBD			Lab 14: Practical
May	1	41	TBD			
	4	42	Why paleontology?			
	11		FINAL EXAM: Monday, 11 May, 8:30-11:30 am			