

GEOL 3405: Concepts in Paleontology

Fall 2010

MWF: 8:00 am – 8:50 am,
T: 1:00 pm -4:00 pm

Sid Richardson 230
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Instructor

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Office Hours

Mondays 9:00 am – 11:00 am
1:00 pm – 5:00 pm
Wednesdays 9:00 am – 11:00 am
Fridays 9:00 am – 11:00 am

Textbook

Principles of Paleontology
Michael Foote
Arnold I. Miller
3rd Edition

Course Description

The lecture portion of this course is designed to introduce students to a variety of paleontological concepts and ideas that are fundamental not only within paleontology, but within the overall field of sedimentary geology and Earth history. The laboratory portion of the course will re-enforce those same concepts, but also provide a fundamental understanding of the characteristics, description, and identification of fossils from each of the major fossil groups.

Expected Learning Outcomes

Any student successfully completing this course should be able:

- Develop the skills of describing, illustrating, and identification of fossil organisms.
- Understand the fundamental processes of fossil preservation (taphonomy).
- Understand the growth and development of individual organisms and the populations they are a part of.
- Understand evolutionary morphology and its study through evolutionary rates and trends.
- Apply the fundamental concepts of paleontology to biostratigraphy, paleoecology, and paleobiogeography.
- Discuss specific, classic examples from paleontological past and how they shaped the current state of the science.

Assessment of Expected Learning Outcomes

The success of a student in completing the expected learning outcomes for the course will be evaluated formally by graded activities, exams, and projects (see below), and informally by pre- and post-course surveys and observation of lab and group work.

Determination of Course Grade

The grade earned in this course will be determined by the student's success in completing the following components of course work. The course grade is determined based points earned versus the points available for the semester resulting in a percentage. The distribution of points among course components is found below:

Component	Number	Points Each	Total Points	Relative Percent
Examinations	3	300	900	60% of Grade
Course Project	1	300	300	20% of Grade
Lab Activities	10	30	300	20% of Grade

The points needed to earn a specific letter grade in the course can be found below:

A (1350 points or more) B (1200-1349 points) C (1050-1199 points) D (900-1049 points) F (899 points or less)

Important: At the end of the semester, the grade a student has earned is based on the number of points the student has earned. Any student asking for a grade bump is out of line. Asking for a grade bump, is asking for special privileges, and is extremely unethical. The instructor will recalculate grades, but will not bump grades. If a student asks for a grade bump the request will be ignored.

- Examinations – The material in this course covers a wide variety of topics and laboratory skills. In order to properly evaluate your success in learning and applying the material three examinations will be throughout the semester and spread over three total periods (approximately three hours). Part A of each exam will be a multiple choice style exam consisting of 60-70 multiple choice questions that will be graded by scantron (100/300 points). Part B of each exam will be an essay style exam where you will be given four essay questions and choose two of the four to write a one to two page answer for (100/300 points). Part C of each exam will be based on laboratory skills and knowledge. This portion of the exam will be hands on and makes up the other 100/300 points for the exam. During the regular semester each part will be given on a different day of the week. The third examination will be given with Part C the last day of class and Parts A and B during the final exam time slot.

- **Course Project** – In early November we will take a field trip to Mineral Wells, Texas (see the field trip description below). During this field trip each of you will make a collection of fossils from the Mineral Wells Fossil Park. This collection will be the basis for your course project. Each student will be responsible for an 8-12 page scientific paper discussing the paleontology of the Mineral Wells Fossil Park. In addition to the notes you take during the field trip, you will be provided with scientific papers to help you complete the task. Each paper will include illustration, descriptions, and identifications of specimens you collected from the Mineral Wells Fossil Park. This paper is due on the day of the Final Exam.
- **Lab Activities** – Labs will meet on Tuesday's this semester, from 1-4 pm. Attendance is mandatory. The general format for the lab will be a brief introduction to the lab (typically an hour or less) followed by time to work on your lab assignment. Each student will turn in their own lab, but working together on the assignment is perfectly acceptable. There may not be time to complete the lab during the lab time but you each have access to the lab using the following code _____ to get the key from the lock box on the door handle. Your names will be submitted to University Police, giving you access to this lab in the late hours of the evening should you need it. The building is typically locked around 9 pm, so if you plan on working late night get in before 9 pm. DO NOT prop open any exterior doors to the building as this is a security risk to the property and to you. Labs are due at the start of the next lab period (see the course schedule as well).
- **Field Trip** – There is one scheduled field trip for this semester. We will leave the university on Friday, November 5th, 2010 at 4:00 pm. We will be travelling to Mineral Wells, TX, where we will be tent camping at Lake Mineral Wells State Park. All meals will be provided by the department. If you need a tent the department has a few tents that can be shared. You will need to wear long pants, boots, and be well prepared for whatever weather may occur. This is a rain or shine event. Everyone must attend this trip, as you will be receiving the background geology and making the sample collections for your course project. We will return to the University no later than 5:00 pm on Sunday, November 7th, 2010.

University Policies

The university has specific policies on attendance, the use of electronic equipment in the classroom, students with disabilities, and official university communications, as well as an official calendar for the semester. See attached sheet of University Policies and Important Dates.

Course Schedule

The following is the schedule that will be used for this semester. Adjustments may be made at any time by the instructor and will be supplied virtually in blackboard as updates are made. It is the instructor's goal that modifications to this schedule will be minimal throughout the semester.

<u>Date</u>	<u>Topic</u>	<u>Chapter</u>	<u>Other</u>
08/23/2010 (M)	Introduction	1	
08/24/2010 (T)	Lab 1: Taphonomy	1, Handouts	
08/25/2010 (W)	Taphonomy and the Fossil Record	1	
08/27/2010 (F)	Taphonomy and the Fossil Record	1	
08/30/2010 (M)	Growth and Form of Organisms	2	
08/31/2010 (T)	Lab 2: The Major Fossil Groups	Handouts	Lab 1 Due
09/01/2010 (W)	Growth and Form of Organisms	2	
09/03/2010 (F)	Growth and Form of Organisms	2	
09/06/2010 (M)	Populations and the Species Concept	3	
09/07/2010 (T)	Lab 3: Unicellular Life (Foraminifera, Radiolarian, & Diatoms)	Handouts	Lab 2 Due
09/08/2010 (W)	Populations and the Species Concept	3	
09/10/2010 (F)	Populations and the Species Concept	3	
09/13/2010 (M)	Systematics and Classification	4	
09/14/2010 (T)	Lab 4: Simple Invertebrates (Porifera & Cnidaria)	Handouts	Lab 3 Due
09/15/2010 (W)	Systematics and Classification	4	
09/17/2010 (F)	Systematics and Classification	4	
09/20/2010 (M)	EXAMINATION 1 PART A	T1-4, L1-3	Multiple Choice Exam
09/21/2010 (T)	Lab 5: Complex Invertebrates I (Arthropoda)	Handouts	
09/22/2010 (W)	EXAMINATION 1 PART B	T1-4, L1-3	Essay Exam
09/24/2010 (F)	EXAMINATION 1 PART C	T1-4, L1-3	Lab Exam

<u>Date</u>	<u>Topic</u>	<u>Chapter</u>	<u>Other</u>
09/27/2010 (M)	Evolutionary Morphology	5	
09/28/2010 (T)	Lab 6: Complex Invertebrates II (Lophophorata)	Handouts	Labs 4 and 5 Due
09/29/2010 (W)	Evolutionary Morphology	5	
10/01/2010 (F)	No Class – Holland School Field Trip	NA	
10/04/2010 (M)	Evolutionary Morphology	5	
10/05/2010 (T)	Lab 6 (ctd): Complex Invertebrates II (Lophophorata)	Handouts	
10/06/2010 (W)	Biostratigraphy	6	
10/08/2010 (F)	Biostratigraphy	6	
10/11/2010 (M)	Biostratigraphy	6	
10/12/2010 (T)	Lab 7: Complex Invertebrates II (Mollusca)	Handouts	Lab 6 Due
10/13/2010 (W)	Evolutionary Rates	7	
10/15/2010 (F)	Evolutionary Rates	7	
10/18/2010 (M)	Evolutionary Rates	7	
10/19/2010 (T)	Lab 7 (ctd): Complex Invertebrates II: (Mollusca)	Handouts	
10/20/2010 (W)	Evolutionary Rates	7	
10/22/2010 (F)	No Class – BW Aston Fall Break	NA	
10/25/2010 (M)	EXAMINATION 2 PART A	T5-7, L4-6	Multiple Choice Exam
10/26/2010 (T)	Lab 8: Complex Invertebrates III: (Echinodermata)	Handouts	Lab 7 Due
10/27/2010 (W)	EXAMINATION 2 PART B	T5-7, L4-6	Essay Exam
10/29/2010 (F)	EXAMINATION 2 PART C	T5-7, L4-6	Lab Exam
11/01/2010 (M)	Global Diversification and Extinction	8	
11/02/2010 (T)	Lab 8 (ctd): Complex Invertebrates III: (Echinodermata)	Handouts	
11/03/2010 (W)	Global Diversification and Extinction	8	
11/05/2010 (F)	Global Diversification and Extinction	8	Leave for Field Trip (4 pm)
11/06/2010 (S)	Geology of Mineral Wells, TX	Handouts	Camp at LMWSP
11/07/2010 (Su)	Mineral Wells Fossil Park Project	Handouts	Return to Abilene (5 pm)
11/08/2010 (M)	Paleoecology and Paleobiogeography	9	
11/09/2010 (T)	Lab 9: Biostratigraphy and the Conodonts	Handouts	Lab 8 Due
11/10/2010 (W)	Paleoecology and Paleobiogeography	9	
11/12/2010 (F)	Paleoecology and Paleobiogeography	9	
11/15/2010 (M)	The Cambrian Explosion of Life	10 (pp. 287-297)	
11/16/2010 (T)	Lab 9 (ctd): Biostratigraphy and the Conodonts	Handouts	
11/17/2010 (W)	The Late Permian Extinction	10 (pp. 297-299)	
11/19/2010 (F)	More Recent Paleontological Events	10 (pp. 300-306)	
11/22/2010 (M)	Project Work	Handouts	
11/23/2010 (T)	Lab 10: Other Fossils (Miscellaneous Groups)	Handouts	Lab 9 Due
11/24/2010 (W)	No Class – Thanksgiving Holiday	NA	
11/26/2010 (F)	No Class – Thanksgiving Holiday	NA	
11/29/2010 (M)	Project Work	Handouts	
11/30/2010 (T)	Project Work	Handouts	Lab 10 Due
12/01/2010 (W)	Project Work	Handouts	
12/03/2010 (F)	EXAMINATION 3 PART C	T8-7, L7-10	Lab Exam
12/06/2010 (M)	EXAMINATION 3 PARTS A & B (8:00 – 9:50 am)	T8-7, L7-10	M. Choice & Essay Exam Final Paper Due