

# Paleobiology

GEOL 320

Lafayette College

Spring 2009

Professor: David Sunderlin  
Room: VW 105  
Lecture: 9-9:50 MWF  
Lab: 1:10-4:00 Th  
Office Hrs: by appointment or if my  
door is open  
Office: VW 101B (x5198) or Lab 6  
in the basement  
Email: [sunderld@lafayette.edu](mailto:sunderld@lafayette.edu)



Moodle Site Utilized

## COURSE DESCRIPTION:

An organismal and systems approach to the study of the marine and terrestrial fossil record. The course will focus on diversification and extinction of biotas in the context of the environmental history of Earth. Weekly laboratory and one required weekend field trip.

## COURSE GOALS:

1. Synthesize the general character of the fossil and stratigraphic records on Earth
2. Evaluate the data that suggest major events and trends in evolutionary history of plant and animal forms
3. Analyze the possible causes of major changes in Earth environments and life
4. Gain proficiency using basic paleobiological methods and analysis techniques in the lab and field
5. Identify major fossil groups and utilize knowledge of their age and lifestyles in making paleoenvironmental interpretations

## COURSE COMPONENTS

### 1. Texts/Readings/Guest Lectures

To my extreme disappointment, I am not the fountain of all paleontological knowledge. It is therefore essential that you keep up with the readings and attend all related guest lectures that will occur throughout the semester if you want to really learn paleo and do well in the course. The required texts are Michael Foote & Arnold Miller's "*Principles of Paleontology*" (2007) and David Quammen's "*The Reluctant Mr. Darwin*" (2007). Primary literature readings will be sprinkled throughout the course to aid in our learning and serve as discussion fodder. I have arranged for distinguished guest speakers (including Quammen) to come to campus and engage with our class too.

### 2. Labs

What constitutes a "lab" in this course is quite varied. The labs will essentially be specimen or concept-based learning in continuation of the topics/concepts discussed during our "lecture" meetings. You will not need a laboratory notebook until after Spring Break.

### 3. Assessments

Assessments include Mid-Term and Final Examinations, one Lab Exam, and MANY Quizzes. The Mid-Term Examination will cover material from the first half of the course. The Lab Exam will be specimen-based and 40 minutes long during a lab period late in the term. The Final will be at the college's assigned time and will be a longer cumulative exam for the entire course. Quizzes of five minutes length will occur frequently & regularly throughout the semester. The focus of quizzes will be topic of reading and lectures before they occur. Keep up with the reading & lecture notes and your success on the quizzes is probable.

### 4. Field Trip

We will be taking a weekend field trip in late spring to Calvert Cliffs, MD in order to demonstrate field techniques, familiarize you with what sort of data are available from the fossil record, and show you how fun field paleontology can be. This field trip is required and the details of it are TBA.

### 5. EXTRAS: Creature Feature & Seafood Symposium

Each student will present a 5-10 minute oral presentation during lab time on a "living fossil". I call these "*Creature Features*". *PowerPoint*, overheads, or other media are fine. Submit your draft presentation two days prior to the day you present. More details TBA. Late in the semester we will also do a mock paleoecology symposium (while eating the various phyla we have studied in the form of sushi). For this each student will present a 5 minute synopsis of a published case study in the discipline. More details TBA.

#### GRADING BREAKDOWN:

Mid-Term:	15%
Final:	20%
Quizzes :	20%
Labs:	21%
Lab Exam:	9%
Evol. Theory Exercise:	5%
Seafood Symposium:	5%
Creature Feature:	5%

Items graded by letter will have the following percentages calculated in the final grade:

A = 100% : A- = 91.5% : B+ = 88.5% : B = 85% : B- = 81.5%

C+ = 78.5% : C = 75% : C- = 71.5% : D+ = 68.5% : D = 65% : D- = 61.5% : F = 0%

#### ATTENDANCE POLICY:

Attendance is *STRONGLY* recommended in lecture and mandatory for the laboratory/field trip. I will occasionally post *key* figures or slides on Moodle after a class. All material in the course is fair game on any graded assessment however; readings, handouts, laboratories, *and* material presented only verbally. You are responsible for obtaining any lecture announcements or notes (from Moodle and from a classmate) on days that you miss.

Participation in classroom and laboratory discussion is encouraged. Please be prepared for class and **BE READY TO BE CALLED UPON** to provide your thoughts.

#### LATE ASSIGNMENT POLICY:

Any assignments done outside of class time are due on the date specified in class. The penalty for turning in any assignment late will be calculated as:

$$N = N_o e^{-kt}$$

where  $N_o$  = grade you received out of the total possible points

$k$  = decay constant of your grade (for this class the value is 0.1)

$t$  = number of days late (days end at 5pm and the weekend = 1 day)

$N$  = your modified grade for that assignment

#### MAKE-UP POLICY:

Prior notice with a wonderfully valid excuse is required for rescheduling an assessment. Students missing the assessment without prior arrangement will be expected to produce a valid excuse of emergency with clearance from a medical professional or LC Dean. Students unable to produce this will receive zero points on the assessment.

#### ACADEMIC DISHONESTY POLICY:

Lafayette College maintains a strict stance against academic dishonesty/fraud. This course adheres to this philosophy.

## COURSE SCHEDULE

Date	Class Meeting Topics	"Lab"	Text Reading
<b>Week 1</b> Jan 26th	Introduction to the Stratigraphic and Fossil Record Fossilization & Taphonomy	1 Fossil Lock-In	FM1
<b>Week 2</b> Feb 2nd	Biological Units: Individuals to "Species"	2 Morphometrics	FM2&3
<b>Week 3</b> Feb 9th	Systematics & Classification/Databases	3 Phenetics/ Cladistics	FM4
<b>Week 4</b> Feb 16th	Evolutionary Theory/Readings	Evolutionary Theory Discussion	FM7 / Quammen
<b>Week 5</b> Feb 23rd	Evolutionary Theory cont'd / Quammen Lecture	Quammen Visit	Quammen
<b>Week 6</b> Mar 2nd	Diversity/Extinction Analysis	4 Diversity Analysis	FM8
<b>Week 7</b> Mar 9th	Diversity/Extinction Analysis	<b>MID TERM EXAM</b>	FM8
<b>Week 8</b> Mar 16th	SPRING BREAK	NO LAB	
<b>Week 9</b> Mar 23rd	Early Life, Ediacarans & Cambrian Fauna	5 Cambrian Fauna	Parts of FM5(arthros) & 10(287-297)
<b>Week 10</b> Mar 30th	Paleozoic Fauna , Early Vertebrates, & Paleophytic Flora	6 Paleozoic Fauna	Parts of FM5(bryos/ crinos), 10 (297-300)
<b>Week 11</b> Apr 6th	Paleozoic Fauna , Early Vertebrates, & Paleophytic Flora	6 Paleozoic Fauna 8 Chesapeake?	
<b>Week 12</b> Apr 13th	Modern Fauna, Meso/Cenophytic Flora, & Later Vertebrates	7 Modern Fauna 8 Chesapeake?	Parts of FM5 (mollusks/verts)
<b>Week 13</b> Apr 20th	Modern Fauna, Meso/Cenophytic Flora, & Later Vertebrates	7 Modern Fauna 8 Chesapeake?	FM10(300-319)
<b>Week 14</b> Apr 27th	Paleoecology/Paleobiogeography	<b>LAB EXAM</b> 8 Chesapeake?	FM6&9
<b>Week 15</b> May 4th	Paleoecology/Paleobiogeography	Seafood Symposium	FM6&9
<b>Finals Week</b>	<b>FINAL EXAM</b>	NO LAB	

\*\*\*\*\*REDUCE, REUSE, RECYCLE\*\*\*\*\*

When possible, please reduce your paper use for this course!