

# GEL 107 — Earth History: Paleobiology

Fall, 2021

MWF 2:10 - 3:00 PM

Wellman Hall 26

**Instructor:** Tracy Thomson, Rm. 2224 Earth & Physical Sciences Building

**e-mail:** [tjthomson@ucdavis.edu](mailto:tjthomson@ucdavis.edu) **Office hours:** TR 1:00 pm - 2:00 pm, or by appointment.

Office Zoom Link: <https://ucdavis.zoom.us/j/96486725616?pwd=WkhVblAvR2V0RXY1TEZTN2N3OFVhZz09>

**Text (recommended):** Introduction to Paleobiology and the Fossil Record

by Michael J. Benton and David A. T. Harper, 2020 2<sup>nd</sup> Edition, Wiley-Blackwell.

**Requirements:** Midterm I (25%); Midterm II (25%); Final (30%); Essay (15%); Assignments (5%).

## Logistics

**Goals for the course:** My primary goal is to further the development of your critical thinking skills in paleobiology, and how this can lead to a better appreciation for the world we live in today. What is the history and evolution of life as revealed by the fossil record through “deep time,” and how is it relevant to today?

**Class format:** The class is organized around a standard lecture format, but I strongly encourage you to interrupt me to ask questions in class, even we have a large class. I show slides in lecture, so it is a very good idea to come to class regularly to see and hear just what the slides illustrate.

**Expectations for class etiquette:** When class begins, please stop your conversations. If you must arrive at class late or leave early, please do so as quietly and unobtrusively as possible. Cell phones must be turned off and put away during class. Please show respect for me and for fellow classmates and do not engage in disruptive behavior: whispering or talking to others, eating smelly food, or any other activity during lecture that would disturb others or interfere with the learning environment.

**Reading:** The book is available at the UCD Bookstore. Three copies of the book are on 2-hour reserve at Shields Library. The textbook for the class is recommended reading; I *do* recommend that you complete the reading assigned, but do not require it. My lectures will not cover exactly the same material as what is in the book; there are many topics in the book that I will not cover and will not expect you to know, while other topics that I cover in lecture are not in the book at all. I may include course material from other sources in lectures as appropriate, so attending lecture regularly will ensure that you do not miss any relevant information. Check the course Canvas site often for brief lecture notes and slides, for announcements, and other information that I would like you to know in a timely manner.

**Grading:** The exams (and quiz) will focus on material that I cover in lecture and will include multiple choice and true/false questions. The exams will be cumulative but will emphasize more the material covered since the previous exam. Under emergency circumstances, I allow exams to be taken early. For the essay, you will send me a question of your own interest, related to paleobiology, and will then write a short essay of less than two double-spaced pages researching your question, citing three references. I will provide more information and guidance on the essay after the first midterm exam. There will be a few, small assignments given throughout the course which you will have one week to complete. I will have an option for a (very) small amount of extra credit as well.

**Study habits:** I strongly recommend that you attend lectures, read the book, and take notes during class. I will post some brief notes and slides on Canvas for each lecture, but they can't take the place of your own notes, taken during class. If you must miss a class, you should attempt to find out what you missed. The material we cover in this class cannot be understood fully by rote memorization alone; it requires both analysis and synthesis of information. I plan to offer a review session before each exam. I do not return exams but am happy to review your exam with you during my office hours. If you have questions, please come to my office hours or send me an e-mail message to schedule an appointment if you cannot come to office hours. I will make every effort to answer your questions within one day of their receipt.

# Schedule

<u>DATE</u>	<u>LECTURE</u>	<u>READING</u>
September 22	1 – Introduction	
September 24	2 – What is paleobiology? And why should we care?	Chapter 1
September 27	3 – Geology and geological time	Chapter 2
September 29	4 – What is the fossil record? How can data be biased?	Chapter 5
October 1	5 – Biomineralization and paleobiogeochemistry	Chapter 5
October 4	6 – Taphonomy and fossil preservation	Chapter 5
October 6	7 – Ontogeny, individuals, and populations	Chapters 6, 4
October 8	8 – Species, speciation, and phylogeny reconstruction	Chapter 7
October 11	9 – The tree of life, the fossil record of life, and classification	Chapter 7
October 13	Review	
October 15	<b>MIDTERM EXAM I</b> (Lectures 2-9)	
October 18	10 - Adaptation and functional morphology	Chapter 6
October 20	11 - Biomechanics: the physics of biology	Chapter 6
October 22	12 - Evolutionary functional morphology	Chapter 6
October 25	13 - Ecology and paleoecology	Chapter 4
October 27	14 - Inferring paleoecology	Chapter 4
October 29	15 - Evolutionary paleoecology. <b>QUESTION DUE</b>	Chapter 4
November 1	16 - Biogeography and plate tectonics	Chapter 3
November 3	17 - Evolutionary paleobiogeography	Chapter 3
November 5	18 - Biostratigraphy and the stratigraphic record	Chapter 2
November 8	19 - Evolutionary biostratigraphy	Chapter 2
November 10	Review	
November 12	<b>MIDTERM EXAM II</b> (Lectures 10-19)	
November 15	20 – Macroevolution: what is it?	Chapter 7
November 17	21 – Rates of evolution and adaptive radiations	Chapter 7
November 19	22 – Origination and diversification	Chapter 8
November 22	23 – Developmental biology and the fossil record	Chapter 6
November 24	24 – Extinctions as perturbations. <b>ESSAY DUE</b>	Chapter 8
November 26	NO CLASS (Thanksgiving Holiday)	
November 29	25 – Mass extinctions and recoveries	Chapter 8
December 1	26 – Macroevolutionary trends and patterns	Chapter 7
December 3	Review	
December 10	<b>FINAL EXAM:</b> 1:00-2:40 PM in Wellman Hall 26	