Geological Sciences 126
The History of Life on Earth: A View from the Museum

Course Description and Goals: Topically-driven exploration of evolution, environmental change, and the history of life on Earth via the fossil record with the Natural History Museums of Los Angeles, the Science Center, and the La Brea Tar pits as touchstones. We will investigate how the changing Earth and life co-evolved through time to arrive at the diversity of life we see around us today.

After you take this class you should:

1. Understand the fundamental science and **evidence** behind evolution.
2. Understand the major events in evolution and Earth history, including environmental change, atmospheric change, and mass extinctions.
3. Appreciate how all life on Earth as we know it is linked via the genetic code.
4. Appreciate how the fossil record can inform our understanding of the history of life.
5. Appreciate the importance of museums as archives of scientific data and thought.

Professor and TAs:
Professor Frank A. Corsetti, 211 Zumberge Hall, fcorsett@usc.edu (note dropped "i"). Office hours: By appointment or e-mail me at any time. TAs will be posted here once assigned:

Required Reading: Your Inner Fish (Shubin)

Optional Reading: History of Life (Cowen) (see lecture schedule for reading assignments).

Grading:

Midterm 1:	20% February 13th
Midterm 2:	20% April 1st
Final Exam:	20% May 13th
Lab:	25%
Class Project:	15% Due week of April 22nd

Lab: Labs will support and supplement the materials from the lecture. IMPORTANT: **you must pass the lab with at least a 60% to pass the class**. Details of how the labs will run will be provided in lab. A number of the labs will be self-guided at nearby museums, which means there are several weeks where you will not be present in the ZHS lab rooms. Details about the lab, turning in labs, quizzes, etc., will be provided in lab and posted on Brightspace in the first week of class.

Class Project: A 5-10 minute presentation is required for this class on your favorite fossil from a museum or elsewhere. Presentations will take place the final two weeks of class in your lab section. The details will be introduced in lab during week 3—thus, you have plenty of time to work on the project. The project is worth 15% of your grade. Advice: do not wait until the last minute to

do your project. There will be graded milestones along the way to help you finish on time, and example presentations will be given to help you know what we expect.

Brightspace: This course will make extensive use of the Brightspace online system where class notes, the syllabus, labs, class project and other useful materials will be available. Check it frequently.

Poll Everywhere: We will use the online interactive tool, Poll Everywhere, during the class sessions. You will find that the Poll Everywhere questions are a good indication of what will be on the exams. Poll Everywhere will not be used for credit, but you are expected to participate. If you are a borderline grade case, we may look to see how much you participated in Poll Everywhere.

Statement on Academic Conduct: The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Support Systems: A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://ali.usc.edu, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://dsp.usc.edu provides certification

for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of Blackboard, teleconferencing, and other technology.

Readings	Your Inner Fish: **YIF** (Shubin-Required), Numbers = Cowen Chapters (optional)		Lab topic	
	Jan. 14	What is science (and why you don't actually hate science)?	No lab week 1 (labs start week 2)	
	Jan. 16	The Earth we live on (minerals, rocks, and the rock cycle)		
	Jan. 21	Plate tectonics,life, and how the Earth recycles	Intro, Observation-interpretation discussion	ZHS Lab Rooms
	Jan. 23	Evolution Toolkit I: The record of ancient environments		
	Jan. 28	Evolution Toolkit II: What is a fossil and how did it get that way?	Rocks as evidence for ancient environments	ZHS Lab Rooms
1	Jan. 30	Evolution Toolkit III: How to tell geologic time		
	Feb. 4	Evolution Toolkit IV: Building geologic histories	Living organisms as future fossils	***California Science Center***
YIF p. 1-80	Feb. 6	Evolution Toolkit V: Taxonomy vs. phylogeny		
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	Feb. 11	Evolution Toolkit VI: DNA, genes, and the genetic code	Fossils as once-living organisms/symmetry	ZHS Lab Rooms
	Feb. 13	**Midterm 1**		
	Feb. 18	The E Word: Darwinian evolution and the modern synthesis	Building trees	ZHS Lab Rooms
YIF p. 148-157	Feb. 20	Exploring evidence for evolution: DNA, your pets, and fossils		
	Feb. 25	Do eyeballs contradict evoution? Evolution of complex structures	Your Inner Fish	ZHS Lab Rooms
2, 4, 5	Feb. 27	Darwin's dilemma I: The air that you breath		
	Mar. 4	Darwin's dilemma II: The Cambrian Explosion	The major fossilized groups	ZHS Lab Rooms
YIF p. 81-147	Mar. 6	Evolution of Animals I: Origin of seafood		
6, 7, 8				
	Mar. 11	Evolution of Animals II: Your inner fish	Swimming and flying things	***Natural History Museum of LA County***
9, 10	Mar. 13	Evolution of Animals III: No, really…Birds are Dinosaurs!		
	Mar. 18	Spring Break	No Lab	Spring Break
	Mar. 20			
11, 12, 15	Mar. 25	Evolution of Animals IV: Your inner monkey	Dinosaurs!	***Natural History Museum of LA County***
YIF p. 158-210	Mar. 27	Evolution of Plants		
19, 20				
	Apr. 1	**Midterm 2**	Mammals!	***Natural History Museum of LA County***
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	Apr. 3	Co-Evolution		
	Apr. 8	Climate Change Intro: How to read climate proxies through time	LA back in time	***La Brea Tar Pits***
	Apr. 10	Climate Change and Evolution		
	Apr. 15	Snapshots from deep time/major evolutionary trends (plus example project)	Reading the climate record	ZHS Lab Rooms
	Apr. 17	Guest Lecturers from the Natural History Museum		
16	Apr. 22	What is a Mass Extinction and why we should care	**Project Presentations**	ZHS Lab Rooms
	April. 24	Giant space rocks killing things		
13	Apr. 29	Are we in the 6th mass extinction (and what we can do about it)?	**Project Presentations**	ZHS Lab Rooms
	May 1	The Science of Jurassic Park		
	May 13	Final Exam (11AM-1PM)		