EART 7: HISTORY OF LIFE

History of Life is intended to provide a long-term perspective on the evolution of life on Earth. The emphasis is on the nearly 4 billion year fossil record and the information it gives about the evolution of organisms and their ecosystems. You will also learn how scientists formulate hypotheses and how data is collected to test those hypotheses.

Learning Outcomes

This course focuses on scientific literacy, especially the reading of news or magazine articles about scientific topics. By the end of the quarter, you should be able to:

1) Identify the scientific hypothesis of a study described in a news article
2) Describe the evidence used by a study to test the hypothesis
3) Assess the quality of a scientific hypothesis
4) Evaluate the reliability of published sources that discuss scientific topics

You will gain these skills by learning about major events in the evolution of life on Earth, including the following themes:

1) What have been the main stages in the 4 billion year evolution of life?
2) How has global environmental change (e.g. ice ages and other climate changes, major volcanic eruptions, meteorite impacts, etc.) affected the evolution of life?
3) How, in turn, has the continuing evolution of life changed the environment of the Earth itself?

2017 Course Summary:

Instructor and Contact Info: Matthew Clapham: mclapham@ucsc.edu, EMS A208, 459-1276.

Office Hours: I am here to maximize your learning and to help you succeed, so don't hesitate to ask questions or stop by my office to discuss the material. Official times are Wednesdays from 12-2 or Thursdays from 10-11. In case you are unable to make the official office hours, you can also contact me to schedule a meeting. I have an open door policy, so you are welcome to drop by at other times if I am in my office.

Lectures: MWF 2:40-3:45, Thimann lecture 3

Course Website: At eCommons (http://ecommons.ucsc.edu, log in with your UCSC user name and Gold password). Lecture slides will be posted before each class. Visit the eCommons site for pre-lecture reading assignments and quizzes, as well as for the two article summary assignments.

Textbook: There is no required textbook for this course. Science is much more than learning facts, and this course instead emphasizes critical thinking skills for evaluating scientific coverage in the media, so textbooks don't meet our needs. If you want additional reading on the topics we'll cover, the Wikipedia articles tend to be fairly accurate and quite detailed.

Course Work and Grading Scheme

Readings and quizzes (10%)

There will be one assigned reading, on a short news article, before each of the class meetings (not including holidays and test days). You should complete the reading and answer the questions in a quiz on eCommons. You are allowed to refer to the article (or look up any other information) while you are answering the questions. The quiz can be submitted as many times as you want, so you can re-take it to make sure you get everything correct. The eCommons assignment must be completed by 2 PM before class. In total, there will be 24 readings and accompanying quizzes; your grade will drop the four lowest scores in case you have internet issues, run into eCommons problems, have an unexpected personal emergency, or maybe just forget.

Article summary assignments (20%)

You will practice the learning outcome skills – identifying hypotheses and supporting evidence, assessing the quality of scientific hypotheses, and evaluating the reliability of online sources – by completing two article summaries (each worth 10%).

For the first article summary (due by 5 PM on February 17), you can choose one article from a list on 1) the origin of life, 2) great oxygenation event, or 3) Cambrian explosion. The second article summary (due by 5 PM on March 10) will give you a choice from a list of articles on 1) life on land, 2) Permian extinction, or 3) bird evolution. For each assignment, you are also welcome to find a different article yourself, as long as it is related to one of the course topics. If you want to find and use a different article, please send it to me for approval before starting the assignment.

At least one of your two article summaries must be a written report (one page or less), using full sentences and paragraphs to address the guidelines provided in the assignment rubric. For the other article summary, you have the option of choosing a different format to demonstrate your mastery of the course learning outcomes (of course, you can complete written summaries for both assignments). For example, you could produce a comic strip, animated video, interactive web app, or some other format – creativity will be rewarded! If you want to take advantage of the alternative format, please check in with me before starting, and make sure you still address the guidelines in the rubric.

In-class tests (36%)

There will be three tests, each worth 12% of the final grade, during the class periods – one on January 30, one on February 13, and another on March 3. The test format will be multiple choice (please bring one of the red scantron sheets, available at the bookstore) and each test will involve answering questions about media articles on the scientific topics covered in class. All articles will be provided to you in advance of the tests. The tests aim to evaluate whether you can apply your knowledge to assess scientific media articles, not whether you can memorize facts. Because of that goal, you may use any hard-copy material (notes, lecture slides, etc.) for reference during the exam.

The in-class tests are intended to measure your progress in the course, but they also serve as a learning experience through an optional "exam debriefing" exercise. You will have the opportunity to regain up to one-quarter of the lost points by reflecting on your answers, identifying the cause of any mistakes, and explaining the reasoning behind the correct answer. The exam debriefing will be available once the completed tests are returned and answer key posted, and will be due in class no later than one week after it is available.

Final exam (34%)

Like the in-class tests, the final exam will evaluate your mastery of the course learning outcomes. The final exam is cumulative, covering all material from the course. It will primarily include multiple-choice questions, but will also have a short free-response section, both focusing on identifying and evaluating scientific hypotheses and assessing the reliability of media sources. All questions will be based on media articles that will be provided to you before the exam, and you may also use any notes or other printed material for reference.

Grading and extra credit

Grades for all assignments will be posted to eCommons. Please let me know if you spot any mistakes made during data entry and I will correct the error. Aside from correcting errors from counting of points or data entry, I do not regrade assignments or provide extra credit work because it would not be fair to students who are less outgoing (and who therefore might not ask) or who have other time commitments.

Late Policy

Article summary assignments

The due dates for the two article summary assignments (all assignments due at 5 PM on the date, submitted to your drop box at eCommons) are chosen so that you can receive timely feedback to be applied to your next assignment. There should be sufficient time to complete the assignments, especially if you minimize procrastination, but I recognize that deadlines and exams from other courses can occasionally all occur at the same time. Because of that, each due date has a two-day grace period; you can turn in the assignment up to two days (also by 5 PM) after the posted deadline with no questions asked and with no penalty. If you have circumstances that you feel prevent you from completing your best work even with the grace period, please meet with me before the end of the grace period. I am happy to arrange an additional no-penalty extension, as long as you are making progress and we can come up with a plan and timeline to help you succeed.

In-class tests and final exam

Please contact me as soon as possible, ideally before the test or as soon as possible after, if you are unable to attend any of the tests due to illness or other unforeseen emergency.

Plagiarism and academic dishonesty

The scientific method builds upon previous results, but it is extremely important to rephrase ideas in your own words. Rewriting is important not only because it is ethical, but also because plagiarism hinders you from achieving a deeper understanding of concepts and prevents you from practicing important skills like writing. Because academic dishonesty circumvents the learning process, I have a zero-tolerance policy for plagiarism or other forms of cheating. For instances of plagiarism in written material, you will be asked to re-do the assignment and the incident may be referred to your college provost.

Disability accommodation

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body, and I am similarly committed to ensuring everyone can participate in this course. If you require accommodations to achieve equal access in this course, please stop by my office with your letter from the Disability Resource Center (DRC), preferably within the first two weeks of the quarter, so we can discuss ways to ensure your full participation. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Discussion sections: Discussion section attendance is optional and there are no assignments in the sections. You can attend either of the sections (Tuesdays 12-1 or Thursday 4-5), even if you are not registered. The sections give you an opportunity to clarify or review material from lecture, discuss readings, receive help with writing assignments, or prepare for exams. The discussion sections are led by the course TA, Ana Martínez Fernández (amarti43@ucsc.edu).

Class Schedule – Winter 2017

Date	Topic	Due Dates
Jan 9	Overview and introduction	
Jan 11	Origin of Life	
Jan 13	Origin of Life	
Jan 16	*No lecture (MLK Day holiday)*	
Jan 18	Origin of Life	
Jan 20	Great Oxygenation Event	
Jan 23	Great Oxygenation Event	
Jan 25	Great Oxygenation Event	
Jan 27	Cambrian Explosion	
Jan 30	**Test 1 (Origin of Life + Great Oxygenation Event)**	
Feb 1	Cambrian Explosion	
Feb 3	Cambrian Explosion	
Feb 6	Life on Land	
Feb 8	Life on Land	
Feb 10	Life on Land	
Feb 13	**Test 2 (Cambrian Explosion + Life on Land)**	
Feb 15	End-Permian Mass Extinction	
Feb 17	End-Permian Mass Extinction	**Article summary 1**
Feb 20	*No lecture (Presidents Day holiday)*	
Feb 22	End-Permian Mass Extinction	
Feb 24	Bird Evolution	
Feb 27	Bird Evolution	
Mar 1	Bird Evolution	
Mar 3	**Test 3 (Permian Extinction + Bird Evolution)**	
Mar 6	End-Cretaceous Mass Extinction	
Mar 8	End-Cretaceous Mass Extinction	
Mar 10	End-Cretaceous Mass Extinction	**Article summary 2**
Mar 13	Hominids and Megafauna	
Mar 15	Hominids and Megafauna	
Mar 17	Hominids and Megafauna	
Mar 20	**8-11 AM: FINAL EXAM (covers all topics)**	