

Life Through Time (GEO 405)

Fall 2012 Lecture Syllabus

TIME & PLACE: T-Th 2:00-3:30 pm, UTC 3.132

INSTRUCTOR: Julia [Clarke-Julia.Clarke@jsg.utexas.edu](mailto:Julia.Clarke@jsg.utexas.edu)
Office: JSG 3.216D

OFFICE HOURS: T 3:30pm-4:30 (after lecture) W 3-4 pm (right before afternoon lab) (or by appointment- send me an email). Come by and talk about getting involved in research. **JGB 3.216D**

LAB INSTRUCTORS: **All labs meet in JGB 2.310**
Robert Burroughs theancientswalk@gmail.com
Office hours W 9-10 and 2-3.
Joshua Lively joshuarlively@gmail.com
Office hours T 9-10 and F 9-10.
All office hours for TAs are in JGB 2.328

CORE TOPICS: The nature of science. Measuring geological time . Stratigraphy and the ordering of geologic events Fossils and fossilization. Major factors affecting past and present biodiversity. An introduction to evolutionary theory. The history of life. Patterns of change in shape and form. Extinction. Vertebrate evolution.

TEXT: Gould, S.J., (ed.) 2001. The Book of Life. W.W. Norton & Company.

GRADING: The grade for the class is based on the following:

a) Exam 1	Sept. 25	20%
b) Exam 2	Oct. 25	20%
c) Exam 3 (last)	Dec. 6	20%
d) Quizzes, assignments, & participation		15%
e) Laboratory		25%

No final during finals block.

The final class grades may be curved if necessary, but any actual curve will not be known until all grades have been finalized. Curves generally amount to only 1 or 2 points (out of a 100). +/- Grades.

PREREQUISITE: GEO 401, 303, or 312K (or equivalent) with a grade of at least C. If you have not taken and passed one of the above classes, **you will be dropped from this course, no exceptions.**

READINGS: I regularly supplement readings from the text with topical new research for class discussion and exercises. This course uses Blackboard, a Web-based course management system in which a password-protected site is created for each course. Student enrollments in each course are updated each evening. **I will post all non-textbook**

required readings to Blackboard. *You will be responsible for checking the Blackboard course site regularly for class work and announcements.* Blackboard is available at <http://courses.utexas.edu>. Support is provided by the ITS Help Desk at 475-9400 Monday through Friday 8 am to 6 pm, so plan accordingly.

You are responsible for all the material designated as readings on the lecture schedule, and other readings that may be posted to Blackboard as the course progresses. You will be tested on this material. Readings are not redundant with lecture content. Readings provide additional material not necessarily covered in class and are an important supplement to the lectures.

Readings taken from sources other than the text are posted to Blackboard as Acrobat pdf files. In the spirit of preserving the environment I will not be putting paper copies in open reserve. If you do not have a computer you can access these files from public computers in any UT library, or the Geology Undergraduate Computer Lab. Occasionally additional short readings relating to current events may be assigned for in class discussion (Again – check Blackboard).

ASSIGNMENTS AND QUIZZES: *Quizzes, in-class assignments, and participation contribute to 15% of your grade for the course.* Short lecture quizzes (and in-class assignments) will be given without advance notice. These may commonly follow opening class announcements. If you arrive late for a quiz you do not get extra time. If you arrive after the quiz has been turned in, you will receive a zero for that quiz. There will be no make-up quizzes. The quizzes serve a useful purpose: (1) they let me assess how well the class is assimilating the lecture and reading material, and (2) they let you get a feel for the types of questions they will find on the exams.

ATTENDANCE AND ABSENCE: Attendance is required and essential to understand the core material. Quizzes, in-class exercises, and assignments assess attendance and, at least after a short while, I will generally notice if you are not in class.

LAB: You are required to attend the lab section for which you are registered. If you have to miss a lab for any reason, make arrangements with your TA **in advance** to attend a different section. All lab quizzes **must** be taken in your scheduled section at the scheduled meeting time. Your TAs will have additional policies that you must follow. Your TAs are students just like you are and they are there to help you. *Lab grades are a significant part of your overall course grade.*

EXAMS: Students are required to take all exams. There is no exam given during the finals period. Grades will be posted to Blackboard. If you have a university sanctioned scheduling conflict with an exam date, *you must notify me at least 14 days in advance of the scheduled exam*; failure to notify me prior to exam day will result in a zero for that exam. There are no make-up exams. Utilize Blackboard as a resource for exam review. I solicit suggestions for exam keywords in the discussion board section.

OFFICE HOURS: If you have questions that are not answered during lecture, need clarification of a concept or topic we cover, or need more information about a topic, do not hesitate to see us during office hours, or even send us an email with questions.

Feedback is an important part of any kind of learning. Without feedback on how well you understand the material, it is more difficult for you to make significant progress. During this course you will give me feedback on your learning in informal and formal ways, such as assignments or exams. I want you to let me know when something we discuss is not clear. This kind of communication will enable me to provide additional information when needed or to explain a concept in different terms.

CHEATING/UNIVERSITY HONOR CODE: We maintain a zero-tolerance policy on cheating. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, using, buying, stealing, and/or divulging the contents of an examination, removing a test from the examination room, substituting for another person, having someone take a test for you, misplacing or damaging property of the University or destroying information so another student may not have materials, falsifying research data, misrepresenting facts including providing false grades or resumes, presenting someone else's work as one's own academic work, and falsifying academic records. A full and comprehensive statement about what constitutes academic dishonesty can be found in Appendix C, section 11-802 in the General Information bulletin. The Student Judicial Services office in the Office of the Dean of Students has the responsibility for following up and making the final determination.

You are responsible for knowing and following the UT Policies and the UT Honor Code, available through Blackboard when you log in to the course page. The UT Honor Code states:

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

EMAIL: All students should become familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. It is recommended that e-mail be checked daily. The complete text of this policy and instructions for updating your e-mail address are available at <http://www.utexas.edu/its/policies/emailnotify.html>.

In this course e-mail will be used as a means of communication with students. You will be responsible for checking your e-mail regularly for class work and announcements. Note: if you are an employee of the University, your e-mail address in Blackboard is your employee address.

FOOD AND PHONES: Food is not permitted in lecture or lab. The same rules for drinks that apply in the library apply in the lecture (coffee and other drinks must be in a secure cup or bottle). *Please turn off your cell phone when you are in class or lab.* No text messaging in class or lab; if you are messaging etc. on your phone you will be asked to leave class. Laptop computers are allowed. If you are on social networking sites (Facebook etc.)

or email during class, you may lose your right to bring a laptop to class. No electronic devices are permitted during exams or quizzes.

OTHER POINTS:

*Students with disabilities who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed.

See following website for more information:

<http://deanofstudents.utexas.edu/ssd/providing.php>

*Religious holy days sometimes conflict with class and examination schedules. If you miss an examination, work assignment, or other project due to the observance of a religious holy day you will be given an opportunity to complete the work missed within a reasonable time after the absence. It is the policy of The University of Texas at Austin that you must notify each of your instructors at least fourteen days prior to the classes scheduled on dates you will be absent to observe a religious holy day.

*I do not give extra credit assignments to individuals, as they are unfair to other students who worked hard on the regular assignments. I do offer several extra credit opportunities to the entire class on exams, as take home assignments, or in class.

DROP DATES: The last day to drop the course for academic reasons (with approval of the dean) is **Wednesday, November 6, 2012**. After this date, students may go to the office of the Chair of the Department of Geological Sciences, GEO 2.106, to appeal for non-academic reasons. Not attending class does not automatically drop you from the course.

Life Through Time (GEO 405)

Fall 2012 Schedule**

*** This course schedule represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance class learning opportunities. Such changes, communicated clearly, are not unusual and should be expected. Please check for announcements on Blackboard regularly.*

Part I Fundamentals for the Study of the History of Life

Aug. 30 (Th) – Introduction: Scope, Content and Expectations (your and ours)

Sept. 4(Tu) –The Nature of Science

READING: M. Shermer. 1997. “How thinking goes wrong: twenty-five fallacies that lead us to believe weird things” (chapter 3 in “Why People Believe Weird Things”, pp. 44-61).

READING: NEWS Zimmer, C. 2011. How Many Species on Earth? It’s Tricky New York Times Aug. 23, 2011 (2 page pdf.)

READING: NEWS Interview with R. Lohman. Why quake rang like a bell. CNN Online. Aug. 24. 2011. (2 page pdf.)

Sep.6 (Th) – Deep Time: The Pageantry of Life and the Art of its Representation

READING: Textbook: pp. 6-21

Sep. 11 (Tu) – Telling Time: Age of the Universe, Earth and Its Rocks

READING: Geologic Time. From: A Companion Website for Earth Science 11th Edition by Edward J. Tarbuck & Frederick K. Lutgens. pp. 286-306

READING: Zalasiewicz, J. “Working group on the Anthropocene” Subcommision on Quaternary Stratigraphy. ICS. 2 page pdf.

Sep.13 (Th) Earth through Time I: Plate Tectonics, Depositional Environments and Fossils!

READING: Textbook: pp. 22-28

READING: NEWS Johnson. S.K. 2011. Piece of crust stolen from Texas found in Antarctica. www.arstechnica.com 8/2011. 1 page pdf.

READING: NEWS Smith. B. 2012 New evidence of water on mars. 7/30/2012 2 page. pdf. <http://www.redorbit.com/news/space/1112665802/new-evidence-of-water-on-mars-polygons/>

Sept 14 – Last day of the add/drop period.

Sep. 18 (Tu) – Fossilization, Finding Fossils, and the Nature of the Fossil Record

READING: Textbook: pp. 30-35

READING: Carpenter K. 2007. How to make a fossil part 1. pp. 1-10

READING: Novacek. 1997. Excerpt from Dinosaurs of the Flaming Cliffs. pp. 103-106. (The paleontologists tool kit.)

Sep. 20 (Th) – Early Links Between Earth and Life. The Origin of Life. Multicellular Life from the Precambrian to the Cambrian

READING: **Textbook:** pp. 37-48(top).

READING: **Knolls A. et al. 2004.** A new period for the geologic time scale. Science. 305: 621-622.

READING: **Hoffman and Schrag. 2000.** Snowball Earth. Scientific American. 68-75

Sep. 25 (Tu) – **EXAM I**

Part II Classification, Systematics and Evolutionary Processes

Sep. 27 (Th) – Discovery and Systematics: History of Classification, Hierarchies, and Taxonomy

READING: **Winston. J.E.** 1999. Introduction to “Describing Species: Practical Taxonomic Procedure for Biologists”, pp. 3-12(top)

READING: **NEWS Conniff. R.** How species save our lives. 2/27/2011. New York Times. 2pp.

READING: **NEWS Agapakis. C. 2011.** Allergy Recapitulates Phylogeny. www.ScientificAmerican.com 2pp.

Oct. 2 (Tu) – Classification and Systematics: Phylogenetic Systematics

READING: **Baum. D. 2008.** “Reading a Phylogenetic Tree: the Meaning of Monophyletic Groups”. Nature Education 1(1)www.nature.com/scitable

READING: **Lewin. R. A. 2001.** “Why rename things?” Nature, Vol. 410, p. 637

READING: **Greene H.W. 2001.** “Improving taxonomy for us and the other fishes” (response to Lewin, 2001). Nature, Vol. 411, p. 738

HANDOUT.

Oct. 4 (Th) – Evolution I: History of Evolutionary Thought

READING: **Baum, D. 2008.** Trait Evolution on a Phylogenetic Tree: Relatedness, similarity and the myth of evolutionary advancement. Nature Education 1(1).

READING: **Darwin. C. 1859.** Introduction to the first edition of “The Origin of Species.” 4 pp.

READING: **Padian. K. 2008.** Darwin’s enduring legacy. Nature 451:632-634.

READING: **Graur, D., Gouy, M. and D. Wool. 2009.** “In retrospect: Lamarck’s treatise at 200”, Nature, Vol. 460, pp. 688-689

Oct. 9 (Tu) – Evolution II: General Principles and Mechanisms of Evolution

READING: **Jacob. F. 1977.** “Evolution and Tinkering”. Science, Vol. 196, pp. 1161-1166

READING: **Chouard. T. 2010.** “Revenge of the hopeful monster”, Nature, Vol. 463, pp. 864-867.

READING: **Duret, L. 2008.** Neutral theory: The null hypothesis of molecular evolution. Nature Education 1(1).

Oct. 11 (Th) – Evolution III: Speciation and Biodiversity

READING: Textbook: 28-33.

READING: J. Hanken. 1999. “Why are there so many new amphibian species when amphibians are declining?” Trends in Ecology and Evolution, 14: 7-8.

READING: M. Benton. 1997. “Models for the diversification of life”, Trends in Ecology and Evolution, Vol. 12, pp. 490-495.

Oct. 16 (Tu) –Extinctions: Causes, Dynamics, and The Big Five

READING: Textbook: pp. 102-110 (up to “Triassic transition” on p. 110)

READING: Marshall. C. 2010. Marine biodiversity dynamics over deep time. Science. 329. 1156.

READING: NEWS Conniff, R. 2011. Lost and gone forever. New York Times. 3/11/2011.

Oct. 18 (Th) – **Special Event.– No Class: Required Self-Guided Fieldtrip:** Take a tour through time on the 40 Acres -- see pdf and additional information on Blackboard.

<http://www.lib.utexas.edu/geo/fortyacres/40acres3.html>

Short written assignment to be posted on Blackboard will be due on Oct 23.

Part III. A Walk Through Time: Patterns and Processes

Oct. 23. The Deep Watery History of Animals. Early Paleozoic Oceans

READING: Textbook: pp. 48-67 (stop before The Orcadian Basin). Figure on page 68.

Oct. 25 (Th) – **EXAM II**

Oct. 30 (Tu) The Deep Watery History of Vertebrates: Paleozoic Diversity and Ocean shifts.

READING: Textbook: 68-87.

READING: NEWS TBD

Nov. 1 (Th) – The Paleozoic Terrestrial Invasion, the Permian/Triassic boundary. Mesozoic shifts in the terrestrial system (especially plants) and oceans

READING: Textbook: pp. 87-110. 152-159 rise of angiosperms, ocean revolutions

Nov. 6 (Tu) – Life Through the Mesozoic: Amniote Innovations, Archosaur Revolution and Rise of Dinosaurs

READING: Textbook: pp. 110-125 (start at “Triassic transition” on p. 110).

READING: NEWS TBD

Nov. 8 (Th) –Dinosaurs (continued) and the K/T Extinction Event

READING: Textbook: pp. 127-152, 159-167

READING: O’Donoghue, J. Flight of the living dead. New Scientist 11 Dec. 2010 36-40.

- Nov. 13 (Tu) – The K/T Boundary, Climate and Life into the Cenozoic
READING: Textbook: pp. 169-192
READING: EarthGauge Whitepaper. 2011. Paleoclimate: Coring for clues. **Parts 1-2.**
- Nov. 15 (Th) – The Greenhouse World: Climate and Life Across the Cenozoic:
READING: Textbook: pp. 169-192 (continued)
READING: EarthGauge Whitepaper. 2009. Tertiary Paleoclimate. 2pages.
READING: NEWS Smith, B. 2012. New Evidence Points To Tropical Times For Antarctic During Eocene Epoch. www.redorbit.com 8/12/2012.
READING: NEWS Roberts F. and Payne, V. 2012. Why we won't see tropical plants in Antarctica any time soon. Climate Brief.org 8/3/2012.
- Nov. 20 (Tu) – The Icehouse World: Life From the Oligocene to Holocene (+Course Evaluations)
READING: Textbook: pp. 192-217.
READING: EarthGauge. Whitepaper. 2009. Quaternary Paleoclimate. 2 pp.
READING: A. D. Barnosky et al. 2004. Assessing the causes of Late Pleistocene extinctions on the continents. Science, Vol. 306, pp. 70-75
- Nov. 22 (Th) – **Thanksgiving – NO CLASS! (Extra Credit: Dinosaur Dissection)**
- Nov. 27 (Tu) –Human Evolution.
READING: Textbook: pp. 219-238.
READING: NEWS The Economist. Ask the family. Human ancestry has just got more complicated. 8/11/2012. 1page.
- Nov. 29 (Th) - Human Evolution Continued.
READING: Textbook: pp. 238-251.
READING: Tattersall, I. 2006. How we came to be human. Scientific American. 16: 68-73
READING: Balter, M. 2009. On the origin of art and symbolism. Science 323: 709-711.
- Dec. 4 (Tu) – Earth and Life. Course Wrap-up. Final Discussion. In Class Exercise.
WATCH:
http://www.ted.com/talks/joshua_klein_on_the_intelligence_of_crows.html
- Dec. 6 (Th) –**Exam III- during normal last class period. (No final during finals period)**