
Introductory Geosciences I: Historical Geology

GEOL 1122, Sec. 01, Spring 2008

M, W 2:00-3:15

Calloway 205

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Office hours: M/W 3:15-5, Tu 11-2 & 4-5,
or by appointment

Course Description

Historical geology is the scientific study of the origin and history of the earth. In this class, we will discuss such issues as the origin of the earth and life, the development of an oxygen-rich atmosphere, the importance of plate tectonics throughout earth history, the causes and history of climate and sea level changes, the evolution of life in all its ancient and modern diversity, and the amazing consequences of dramatic, unpredictable events in shaping the history of earth and life. Because we can not usually observe these phenomena directly, we will need to understand how scientists unravel history. In particular, you will practice learning how to piece together different lines of evidence to formulate plausible historical scenarios for earth history.

Learning objectives

- 1) Explain the scientific method used by historical geologists to understand the world around us.
- 2) List a brief chronology of the earth, noting critical changes affecting the biosphere, lithosphere, and atmosphere/hydrosphere.
- 3) Compare earth's current state (sea level, climates, continental distribution, biodiversity) to those in the past.
- 4) Describe several examples demonstrating the complex interactions between life, the earth, the oceans, and the atmosphere.
- 5) Describe how scientists arose at our current understanding of the origin and age of the earth, the origin and evolution of life, and other important topics of human knowledge.
- 6) Explain how earth history can be understood using both uniformitarian and catastrophic worldviews.
- 7) Reflect on your history and learning by considering your past experiences, learning strengths and weaknesses, and own educational and personal goals.

Required textbook and course packet

Stanley, S.M. 2005. *Earth System History*. 2nd ed. W.H. Freeman and Co., New York.
Historical Geology (section 1) course packet. Available at the University Bookstore.

Programmatic designation

This course satisfies the non-lab science component of Area D of the Core Curriculum.

WebCT

Although regular attendance is vital to success in this course, it's not sufficient. The WebCT site will also have important information for you, such as announcements, on-line quizzes, learning evaluations, and study guides. You can get to the course site using the WebCT portal: <http://webct.westga.edu>. Once there, log-in and click on the course site. If you have problems logging in or locating the site, just follow the links, contact the Distance Learning helpdesk (678-839-6248 or distance@westga.edu).

A note on my office hours

The best science teachers are those who also conduct scientific research. Although I do research throughout each week, I reserve Fridays for uninterrupted research. So I will not be available to meet with you on this day except for exceptional circumstances. You are still welcome to e-mail me with questions and concerns during this time, and I will make every effort to respond in a timely manner. However, an e-mail response cannot be guaranteed until the following work day. On other days, you're welcome to call me on campus (678-839-4061), stop by when the door is open, or e-mail me (pnovackg@westga.edu). **I don't accept phone calls at my home.**

Grading Policies

Your grades will be assigned on a percentage scale, as follows:

≥90% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = F

Exam #1 (Feb. 18)	20%
Exam #2 (Apr. 7)	20%
Cumulative Final Exam (May. 7)	20%
In-class and take-home assignments	15%
WebCT quizzes	10%
Causes of major event assignment (Mar. 24)	5%
Learning evaluations	5%
Attendance and participation	5%

Exams

The exams in this class are typically take-home, although this is subject to change. In general, I will try to have you apply information learned in class instead of asking you simply to repeat what I have told you. Memorization, last minute studying, and dependence on lecture notes are not useful strategies. Rather, you may be given

exam questions that cover material that was not explicitly mentioned in class. Although this sounds daunting, you will have up to a week to figure out the correct explanation using material from lecture, the textbook, and your own reasoning. In fact, you will be encouraged at times to work with others to solve these sometimes complex problems. However, you will have to write your own answers to these questions on the exam. I will have much more to say later about these exams as we continue through the course.

The first two, non-cumulative exams will occur on Wednesday, **Feb. 18** and Monday, **Apr. 7**. The final exam is cumulative and will be on Monday, **May 7, 2 - 4 PM**. It will have the same general format as the previous exams.

WebCT quizzes

There will be a short, graded quiz on WebCT each week (including the week of the 1st and 2nd exams). Unlike the exams that will require synthesis of information and evaluation of complex geological problems, the weekly WebCT quiz will cover the basic information covered in lecture and in the textbook. **The quiz will be available each week, from 3:30 PM on Wednesday until 1:45 PM on the following Wednesday.** If you come to class regularly and read the textbook, the quiz should only take about 10 minutes. **However, the quiz will be open note, and you will have two hours to take it.** Once you start a session, you will only have one opportunity to finish it. Make sure that you set enough time to finish the quiz. These quizzes are graded and you will have immediate feedback after you submit the answers. **Although there will be 16 quizzes, your quiz grade will be based only on your 9 best scores.** This gives you room to drop low scores or to miss a weekly quiz for whatever reason. Under no circumstances will you be able to take any quiz once the session time has ended. I suggest you do not wait until the last minute; power outages, snow storms, and other unpredictable events seem to occur at the most inopportune times!

An **in-class quiz** covering the geological timescale (**Quiz #5**) will occur on **Feb. 11**. **This quiz is mandatory and will be included in the calculation of your overall quiz average.**

In-class and take-home assignments

There will be sporadic assignments and activities throughout the semester. Some assignments will be turned in over WebCT to help you prepare for the following class; others will be due in class. These assignments may include case studies of actual geological scenarios, ideas to think about, problems to help you prepare for the exams, or demonstrations to reinforce an idea presented in lecture. Because these assignments will form an integral portion of our classroom experience, it is critical that you come to class and participate. For each of these assignments, I will give you an evaluation of 2, 1, or 0 based on my determination of your thoughtful participation. You must be in class to earn credit for the in-class activities; make-ups are not possible.

Causes of major event assignment

One of the most important goals of the historical sciences is to explain the causes of major events in the history of life, the earth, the atmosphere, and the oceans. Two of the most important events in life history are the Cambrian explosion and the Permo-Triassic mass extinction. Each of you will focus on one of these two events (to be chosen in class at a later date). You will have to locate a primary research article describing a hypothesis about the cause of your event, and then write a concise and very brief summary (several sentences) of the proposed hypothesis for the class. Your research will then be used in a class discussion. This assignment will be due on Monday **Mar. 24**. I will give you more details about this project at a later date.

Learning evaluations

In order to have the best course learning experience, there will be regular opportunities to gauge both your learning and my teaching. An example of a learning evaluation might be to reflect on your lifetime goals and to see how (or if) your current college experience is useful for these goals. An example of the latter might be to offer suggestions on what is most successful about class and what is least successful. In this way, we are both mutual learners. For each of these assignments, I will give you an evaluation of 2, 1, or 0 based on my determination of your thoughtful participation. **Although there will be several learning evaluations during the semester, your grade will be based only on your 5 best evaluations. However, you must take the first two.**

Attendance and participation

I will take attendance at random times throughout the semester. Regular attendance and participation will give you full credit; regular absences and indifference will not. Appropriate participation includes attentiveness, participation in class discussions, respectful behavior, and courteousness to your peers. If you do not wish to participate in this class, you should strongly consider withdrawing before you have wasted your money, time, and effort.

Lateness

Lateness is to be avoided. To compel you to hand exams and learning evaluations in when they are due, there is a lateness policy. **I will deduct 10% per day for all late exams and assignments (except weekends).** Thus, an exam or assignment that is one week late can score at most 50%. Please see me after this date if you wish to receive any credit for the exam. **For learning evaluations and take-home assignments, I will deduct 1 point per class. You may not make-up in-class activities.**

A promise

I want you to do well in this course, and I know you can. To encourage you to come to class and to do the quizzes and learning evaluations (as if you wouldn't want to anyway), I will add 3% to your final course grade if you do **every** quiz and learning evaluation and **90%** of the in-class and take-home assignments, regardless of your performance in the class.

Academic honesty policy

I take academic honesty very seriously. Plagiarism of any sort will not be tolerated. Plagiarism is the use of someone else's ideas or words as your own. This definition includes copying another student's exam or assignment as well as using material from a book or internet site without acknowledging the source. If you plagiarize any part of an assignment for this course, you will receive a zero for the entire assignment and disciplinary action will be taken.

What if I miss a class?

It is your responsibility to come to class regularly and to take notes. If you miss a class, I assume that you will contact at least two other classmates to learn what happened in class on the day you were absent, and to receive any materials distributed that day.

What if I miss an exam?

Exams are take-home and will be accepted late with a 10% per day (except weekends) penalty. See "Lateness" above.

What if I come late to a class?

Students who arrive to class late not only miss important information, but also disrupt other students' learning. For this reason, I expect that you will be on time and ready to begin work.

Will extra credit be available?

Not usually. Each exam will have an extra-credit question and the Causes assignment will have the opportunity for some extra credit. Aside from these, your grade will be based only on your performance on the items in the Grading Policy. Make the most of every opportunity.

12 ways to do well in this course:

- 1) Attend class regularly.
- 2) Visit the WebCT site regularly.
- 3) Come to class curious about the history of the earth and prepared to learn.
- 4) Come to class early and open your notes before class starts.
- 5) Look over your notes from the previous class before class starts.
- 6) Introduce yourself to me. I ask questions to those I don't yet know!
- 7) Ask questions! Ask during class, ask during office hours, ask whenever.
- 8) Be courteous and respectful. Turn off your cell phone and iPod, do not chat, and do not walk around class. Your peers and I will be offended, and you may be asked to leave.
- 9) Look over your notes sometime after each class ends.
- 10) Read your textbook, and use it to make sense of those areas you didn't quite understand from lecture. A different perspective always helps.
- 11) Have a good night's sleep.
- 12) Attend class regularly.

Some additional things you should know

There are many resources available to you outside of class beside your professors. The Division of Student Services (<http://www.westga.edu/~stusrvcl/>) offers many resources, including disability, health, and career services. If you have or believe you have a documented disability, it is important to contact both them and me so that we can best facilitate your learning. Another useful resource is the Student Development Center (<http://www.westga.edu/~sdev/>) that offers personal, psychological, and academic counseling. If you feel overwhelmed, you should consider contacting them. Finally, the EXCEL Center (<http://www.westga.edu/~EXCELCenter/>) offers **free tutoring for this class**, assistance on study skills, student mentorships, academic advising, multicultural achievement programs, and much more. You have already paid for these excellent services; you should take advantage of them.

A final caveat

Your professor is not capricious, but he does reserve the right to alter this syllabus, class policies, or the class schedule to best accommodate the needs of the class. If such a change is needed, you will be given sufficient and timely notice, as well as the ability to contest or contribute to the alterations thereof.

Schedule		
<i>Date</i>	<i>Topic</i>	<i>Readings</i>
Jan. 9	Historians of the earth	Pp. 1-11, 18-24
Jan. 14	A primer on planet earth: A rocky introduction	Ch. 2
Jan. 16	Sedimentary rocks & depositional environments	Ch. 5, peruse pp. 87-100
Jan. 21	No Class (Martin Luther King, Jr Day)	
Jan. 23	Sedimentary structures and facies	Pp. 44-45, 137-139, Ch. 5 continued
Jan. 28	Stratigraphy, sequences, and sea level changes	Pp. 9-11, 143-150
Jan. 30	Telling time: Rocks of ages	Pp. 23-24, 137, 139-143
Feb. 4	Faunal succession and the geological timescale	Pp. 11-13, 129-137, 143-150
Feb. 6	Fossilization	Pp. 49-54
Feb. 11	Biodiversity and the organization of life	Pp. 54-62; Timescale quiz!
Feb. 13	No class (Prepare for exam)	
Feb. 18	EXAM 1 due	
Feb. 20	The myriad mechanisms of evolution: Microevolution of populations	Pp. 61-66, 153-161; peruse 67-76
Feb. 25	Mechanisms continued: From species to clades	Pp. 161-166
Feb. 27	Evolution in the fossil record: Case studies	Pp. 169-174
Mar. 3	Origin of the earth, moon, and stars	Pp. 13-15
Mar. 5	Archean Earth and the emergence of tectonics	Ch. 11, pp. 15-18, 177-179, 185-195
Mar. 10	The origin of life	Pp. 262-270
Mar. 12	Proterozoic Earth: Rodinia, BIFs, glaciers, acritarchs, and stromatolites	Ch. 12
Mar.17/19	Spring break! (no classes)	
Mar. 24	Paleozoic Earth: The brief life of Iapetus	Peruse ch. 9; Causes assignment!
Mar. 26	Paleozoic Earth: Orogenies, tectonics, climates, and glaciations	Pp. 318-323, 344-352, 366-367, 376-381, peruse ch. 10
Mar. 31	The Cambrian explosion and early Paleozoic life	Pp. 281-286, 299-309, 312-315
Apr. 2	No Class (Convocation; Prepare for exam)	
Apr. 7	EXAM 2 due	
Apr. 9	Paleozoic life: Of radiations and extinctions	Pp. 166-169, 309-312, 315-318
Apr. 14	Middle Paleozoic life, fishes, and terrestriality	Pp. 327-344, 355-364, 370-371
Apr. 16	Permian and Triassic: Life in the crosshairs	Pp. 364-369, 371-376, 381-384, 404-405, 407-411
Apr. 21	Mesozoic Earth: Of hothouses and icehouses, dinosaurs and ammonoids	Pp. 387-409, 411-414, 417-423, 428-433, 437-442
Apr. 23	K-T mass extinction & luck of mammals & flowers	Pp. 423-428, 433-437
Apr. 28	Cenozoic earth, climate change, and life on grasslands	Ch. 18 & 19
Apr. 30	Holocene Earth: After the Ice Age	Ch. 20