

## SYLLABUS GEOL 1122 HISTORY OF GLOBAL CHANGE FALL 2008

### Professors:

**18 August- September 2008:** Dr. Sally E. Walker, Office room 320 Geology/Geography Bldg; Office hours by arrangement; please contact: [swalker@gly.uga.edu](mailto:swalker@gly.uga.edu)

**October-December 2008:** Dr. Marta Patiño-Douce, Office room 3 (Basement). Office hours by arrangement. Please contact: [mpatino@uga.edu](mailto:mpatino@uga.edu)

**Lecture Facilitator:** Ms. Eleanor Gardner, Office: (21Basement of Geology Building)

**Course:** 12:20 - 1:10 pm MWF GEOL 1122 No. 42-516 Room 200 A (listed under Walker).  
1:25 - 2:15 pm MWF GEOL 1122 No. 12-506 Room 200A (listed under Patiño-Douce).

You may also take a lab course (GEOL 1222L) that will complement your geology learning.

**Goals:** To facilitate your understanding of the global dynamics in relation to climate change, environmental change, and biodiversity change over the billions of years of Earth's history as recorded in the rock and fossil record.

**Required Lecture Text:** *Earth Systems History* by Stephen Stanley, 2005, W. H. Freeman, Inc.

**Websites:** Helpful class outlines, and notes are available for all lectures and to review for exams on Dr. Patiño-Douce's website: <http://mapatino.myweb.uga.edu>. Dr. Walker will have her class outlines posted on her website (she'll give the URL the second day of classes). To facilitate your learning, please visit those websites as they distill the information that we will focus on in the class and on the exams. Please download the outline and bring it to class. Please E-mail us if you can't retrieve the website info.

**Please note:** This syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

### LECTURE, READING AND EXAM/PROJECT SCHEDULE FALL 2008 GEOL 1122

WEEK	TOPIC	READING/BRIEFS
<b>1</b> <b>18- 22 Aug</b>	<b>Part I. The Earth's System: Product and Process</b> <b>Introduction:</b> Earth's structure and major rock & mineral types as united by the process of Plate Tectonics. The Earth is composed of a hydrosphere, geosphere, biosphere, and atmosphere that are dynamically linked via chemical, physical, & biological processes.	Chap. 1 (overview), Chap. 10 (major chemical cycles) <b>Drop deadline, Thursday, Aug 21, midnight</b> <b>Add deadline, Friday, August 22, midnight</b>
<b>2</b> <b>25-29 Aug</b>	<b>The Earth is 4.6 billion years old: how do we know?</b> Using rocks, fossils, and radioactive isotopes to determine absolute and relative age dates of Earth's major events Using principles of geology to understand the history of environmental change in the rock record	Chap 1, Chap. 6

<p><b>3</b> <b>3 -5 Sept</b></p>	<p><b>We are stardust: Origin of elements that compose Earth's minerals/rocks/biota traced back to the formation of the universe 13 billion years ago;</b> common rocks/minerals and how you can recognize them, and how you can use them to interpret Earth's past environments/climate</p>	<p>Chap. 2 <b>1 Sept, Monday: Labor Day Holiday, no class.</b></p>
<p><b>4</b> <b>8 -12 Sept</b></p>	<p><b>Evolution and Diversity: all organisms on Earth are related: Life on Earth originated over 3 billion years ago</b> All life, and viruses, share RNA, DNA, or both Evolution can occur through endosymbiosis, natural selection; Diversity of major life forms on earth within 3 Domains: Archaea, Eubacteria, and Eukaryota; Kingdoms and Phyla within the Eukaryota that help us determine environmental &amp; climate change <b>EXAM 1 Friday Sept. 12 (Wk 1-4 topics): Friday</b></p>	<p>Chap. 3, Chap. 7 <b>Exam 1 Friday Sept. 12</b></p>
<p><b>5</b> <b>15 -19 Sept</b></p>	<p><b>Major Environments (marine, terrestrial, fluvial, lacustrine...) on Earth,</b> how they are linked, and how they are recognized in the rock and fossil record and used to interpret global environmental change</p>	<p>Chap.4</p>
<p><b>6</b> <b>22- 26 Sept</b></p>	<p><b>Nitty Gritty Earth Sand: Sedimentary Rocks:</b> Rocks where most climate and environmental change data are found for life on earth, other planets</p>	<p>Chap. 5</p>
<p><b>7</b> <b>29 Sept- 3 Oct</b></p>	<p><b>The Theory of Plate Tectonics:</b> shifting crust that influences climate, sea level, minerals, and biotic diversity on Earth. How scientific ideas develop, get challenged, debated, tested, and applied  <b>EXAM 2 (Wk 4-7)</b></p>	<p>Chap. 8 <b>Exam 2 Friday, 3 Oct</b></p>
<p><b>8</b> <b>6 -10 Oct</b></p>	<p><b>Plate Tectonics, how the theory contributes to our understanding of continental and oceanic crust dynamics,</b> including tsunamis, earthquakes, mountains, rifts...</p>	<p>Chap. 8, Chap. 9</p>
<p><b>9</b> <b>13-17 Oct</b></p>	<p><b>Part II: The Historical Record of Dynamic Earth's Geosphere, Hydrosphere, and Biosphere</b>  <b>The earliest record, Hadean Interval &amp; Archean Eon</b> from molten magma to the earliest crust (4.6 bya-4.3 bya), earliest atmosphere and hydrosphere, how they formed, what they were like from 4.3 bya to 2.5 bya.</p>	<p>Chap. 11 <b>Tues. Oct 14 midpoint Withdrawl deadline</b></p>

<p><b>10</b> <b>20-24 Oct</b></p>	<p><b>The earliest record of life on Earth, Archean Eon (3.8 bya-2.5bya) to Proterozoic Eon (2.5 bya -540 mya).</b> What is life? Characteristics? How do we recognize life forms on earth, other planets (if exist)? What is effect of the origin of life on geosphere, atmosphere, hydrosphere? "RNA world"?</p>	<p>Chap. 12</p>
<p><b>11</b> <b>27-29 Oct</b>  <b>31 Oct</b> <b>fall break</b></p>	<p><b>Proterozoic tectonics and life: 2.5bya-540 mya from</b> Anoxic, sulfidic seas to global oxygenated oceans directly related to the origin and diversification of photosynthesizing organisms (single-celled revolution in oxygen); origin of singled-celled and multi-celled eukaryotes; United Plates of America, the formation of the U.S. craton; "snowball earth", multiple climate oscillations: hot house and ice house conditions.</p> <p><b>Wednesday, Oct. 29 EXAM 3</b></p> <p><b>Friday, Oct. 31, fall break, no class</b></p>	<p>Chap. 12</p> <p><b>Wednesday, Oct. 29: Exam 3</b></p>
<p><b>12</b> <b>3 - 7 Nov</b></p>	<p><b>Paleozoic tectonics and life (540 mya-245 mya):</b> origin of animals (invertebrates vertebrates), spore-and seed-bearing plants, terrestrial ecology begins. Eastern North America active margin, three cycles of tectonics to form Appalachian Mountains, freshwater systems form, fluctuations in sea level, ice house and hot house flux s and how life on Earth responds. Largest Mass Extinction of all time, Permo-Triassic Extinction, 245 mya.</p>	<p>Chap. 13-15</p>
<p><b>13</b> <b>10-14 Nov</b></p>	<p><b>Mesozoic tectonics and climate:</b> Eastern North America becomes a passive margin; Atlantic Ocean and Gulf of Mexico form; western N. America, becomes active margin; Great interior sea way in North America, massive hot house conditions blanket most of the craton; chalk deposits such as White Cliffs of Dover where Churchill's WWII bunkers are located indicated hot house conditions on Earth.</p>	<p>Chap. 16-17</p>
<p><b>14</b> <b>17-21 Nov</b></p>	<p><b>Mesozoic biota:</b> Dinosaur and marine reptiles (amniotes) rule the land and the sea; mammals squeak by as insectivores; giant invertebrates on land and sea Mac-truck sized ammonoids, giant dragon flies, why be giants? Modern forms of marine plankton, diatoms, major photosynthesizers (O<sub>2</sub>) &amp; Global CO<sub>2</sub>; Cretaceous-Paleocene Mass Extinction (extraterrestrial asteroid impact...)</p> <p><b>Friday, Nov. 21 EXAM 4</b></p>	<p>Chap. 16-17</p> <p><b>Friday, Nov. 21 Exam 4</b></p>
<p><b>24 -28 Nov</b></p>	<p><b>Thanksgiving Holiday</b></p>	<p><b>Holiday</b></p>

<b>15</b>  <b>1-5 Dec</b>	<b>Cenozoic Era:</b> plate tectonics and the rapidly shifting cratons affect climate and ocean circulation; from tropical conditions early in the Cenozoic, to cool, milder ice-house conditions later in the Cenozoic when many modern organisms originated and evolved (modern humans). Cenozoic climate change and human <b>civilizations in relation to climate change</b>	Chap. 18-20  <b>Cenozoic Week Extra Credit</b> (seen Extra Credit information on this syllabus)  Gain extra credit to improve your final grade during this week
<b>Monday</b> <b>8 Dec. &amp;</b> <b>Tuesday 9</b> <b>Dec ("a</b> <b>Friday")</b>	<b>Geology Group Projects (written report and presentations are due 8 and 9 Dec)</b>	<b>Geo-Group Project Presentation and Reports are Due</b>

**Exam format:** all exams have approximately 40 questions. Approximately 70% of the questions are multiple choice, 10% are “challenge questions” which could be slides we show in class or a thought problem, the rest of the 20% may be matching, pick-the-best-answer, true-false. Exams contain lecture and reading material questions. All scores/grades will be posted with your 810 number unless you provide the professor with a written & signed request not to post your grade. The 810 numbers with your grade will be randomized before posting to minimize identification. For each exam, please bring a #2 pencil with eraser! No pens, please! All tests are taken on a scantron sheet, and prior to giving the graded scantron back to you, we will a record of how you answered each question.

**Make-up Exams:** We **do not** give make-up exams unless you have an official medical excuse. This excuse must be given to the professor ASAP or by the next lecture following the exam that you missed. This excuse will require the Doctor’s name, the reason for your absence written on the Doctor’s letterhead or official memo and the number where I can contact the Doctor. If you do not have this excuse or the information that you give me is incorrect, then, I can not give you a make-up exam. This applies to other extenuating circumstances.

**Late Project reports will not be accepted.**

**Grades:** 80% of your final grade will be based on four exams; 20% on your final group project (= 10% written report/10% oral presentation), for a total of 100%. The Geo-Group project will be announced by Dr. Patiño-Douce after midterm break, and she'll facilitate your work on this endeavor.

Final grades are based on the following (we do grade on a curve, so these cut-offs may change):

- A: 90-100 %
- B: 80-89.9 %
- C. 70-79.9 %
- D. 60-69.9 %
- F. Below 60%

**Grade Note:** To achieve an A in this course, please review your lecture notes, test yourself with the outline provided for the lectures, read your textbook, and meet with the professor if you need to have your notes checked or to clarify anything. We know that you all want the best grade possible in the class. It is our responsibility to give you the best possible education, and we endeavor to give you the best possible grade based on your work in the class. Students that attend class regularly, keep up with the readings, and

understand the class outline and their notes, often do very well on the exams and in the course. Geology is a process-based science, and GEO-thinking takes time to develop, so please keep up with the material from the very first day of class, or you will quickly get behind. Above all we want you to enjoy learning about geology and the history of the Earth. For borderline final grades, we give you the better grade if you have consistently done well on exams, or did a fantastic group project, and/or participated in class on a regular basis (interacted, asked questions, answer questions, etc.). Minuses and Pluses follow UGA guidelines. For the final grade, we average Dr. Walker's grades with Dr. Patiño-Douce's grades.

**Extra Credit:** students can accumulate extra credit during the Cenozoic Week Classes; each Cenozoic lecture will have lecture questions that you can fill out and turn in at the end of each Cenozoic lecture class for a total of 5 pts. After final point grades are tallied for the class, that 5 pts will be added to your final raw score, and may improve your final grade in the class.

### **Class Attendance and Reasons for Dropping Students from the Class:**

**(1) We will not take attendance, but, if you miss two exams at any time in the class without a verifiable excuse, you will be dropped from the class.**

**(2) If we have to single you out three times for any of the following once lecture starts (i.e., stop the class, ask your name, and kindly ask you to stop), we will drop you from the class:** if you come in 3 minutes late for the start of class, or leave before class is officially over (unless you have a verifiable excuse); if you walk in front of the professor while she is lecturing (a *Ms. Manners NO*); using laptops unless you need them for learning accommodations (bring the paperwork to the profs, see below); using cell phones and text messaging systems (unless you are awaiting on an emergency, you need to clear that with the prof before class starts); reading newspapers, books, etc.; talking; listening to music, munching loudly on gum or other assorted trophic resources in a loud manner, chew and/or smoke, do homework, pass papers or work on homework, etc. from other classes, beeping watches, academically dishonest (see UGA policy below) or any other behavior that the professor deems is disruptive to the class.

**Learning Accommodations:** please bring your learning accommodation information to me by the end of the second week of classes so that I may schedule rooms, teaching assistants, and special tests for you if you need them. If you think you might need to be tested for difficulties in learning, please contact Disabilities Resource Center as soon as possible to schedule an appointment. They are located in Clarke Howell and their number is: 542-8719.

**Class Ethics/Academic Honesty:** We expect that you will act with academic honesty and integrity and will follow the *UGA Code of Academic Honesty*. Students should observe at all times a conduct in accordance with the principles of Academic Honesty outlined in the booklet, "*A Culture of Honesty*" published by the University of Georgia. Students involved in dishonest behavior risk being suspended or expelled from UGA.