PLATE TECTONICS AND EARTH HISTORY

INSTRUCTOR - Dr. James Sprinkle        Office - JGB 4.106       Lecture – JGB 2.218
Mailbox in EPS 1.130A; office phone 471-4264; e-mail - echino@mail.utexas.edu
Office Hours - Tu, Th 12-12:30 PM; F 12-1 PM, M, W 1-2 PM; other times by appointment

TAs – Ashley Latimer <latimer.ae@gmail.com> and Zhi-Heng Li <lizhiheng1982@hotmail.com>
Office hours in Lab Room JGB 3.202; hours to be selected

PREREQUISITES - A grade of C or better in GEO 401 or 303 or 312K or the equivalent.

COURSE TOPICS - The geologic time scale, new 2004 version (1st lecture)
- Structure and composition of the earth (2 lectures)
- Plate tectonics and its implications to earth history (5 lectures)
- Sedimentary rocks and depositional environments (5 lectures)
- Setting up and measuring “deep” geologic time (4 lectures)
- Fossils, history of life, and evolution (3 lectures)
- History of the Southern African & North American continents (6 lectures)
- Origin and evolution of invertebrates, plants, and vertebrates (8 lectures)
- Human evolution and place in nature (2 lecture)

Lecture Outlines (plus Syllabus, Lecture Schedule, and other information) will be posted on the GEO 404C Blackboard site: <https://courses.utexas.edu/webapps/portal/frameset.jsp>


COURSE READING - Other reading assignments are in the Geology Library (4th floor) either on reserve (books), or in my file cabinet drawer (separates) at the back of the Reading Room.

EXAMS AND COURSE GRADES - Grades will be determined in the following manner:

Lecture - 2-week Friday quizzes (6 total, count top 5) - 15%
- 1st Hour Exam - Friday, Feb. 17th - 15%
- 2nd Hour Exam - Friday, Mar. 30th - 15%
- Final Exam - Mon., May 14th, 2-5 PM, 2 hrs. - 30%

Discussion Section - Exams, exercises, and participation - 25%
Total - 100%

Lecture quizzes, exams, and the final may include any of the following types of questions: true-false, multiple choice, matching, complete-the-answer, lists, definitions, problems, drawings or charts, and short to intermediate-length essays. All exams are closed-book and are usually intermediate in difficulty. Hour exams and the final are cumulative, covering all previous work up to the time of that exam; quizzes will cover the previous 2-weeks' work (usually 4-6 lectures). Marks will be carried
through as numbers, added up at the end of the course, and then curved to get a final grade. Last spring's average mark for this course was a 68.6 (top mark 91.2, lowest mark 37.3), and there were 12 A's, 37 B's, 28 C's, 7 D's, 1 F, 2 X's, and 1 Q, in a fairly large class of 88, giving an overall class GPA of 2.52. Some plus and minus grades will be given to students near a major grade boundary.

ACADEMIC POLICIES - No special policy on drops, incompletes, or time extensions; see General Information Catalog, Part V. A make-up exam for a missed hour exam may be given at the instructor's discretion up to the time of the next lecture period (usually a Monday) when the corrected exams are returned. Last day to drop this course without academic penalty is Monday, Feb. 13th; last day to drop this course or withdraw (need Dean's approval) is Monday, March 26th.

STUDENTS WITH DISABILITIES may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259 or http://www.utexas.edu/diversity/ddce/ssd/

ACCOMMODATIONS FOR RELIGIOUS HOLIDAYS – By UT Austin policy, a student must notify the instructor of a pending absence from class at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a lab assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missing work within a reasonable time after the absence.
Wed., Jan. 18 - Introduction + the new 2004 geologic time scale
   Memorize time scale handout
   Bjornerud, p. 53-63
   McCarthy & Rubidge, p. 71

Fri., Jan. 20 - The Earth's interior plus continents and oceans
   Prothero & Dott, 2010, p. 104-116
   McCarthy & Rubidge, p. 28-32, p. 51

Mon., Jan. 23 - Geosynclines and mountain belts
   McCarthy & Rubidge, p. 25-27

Wed., Jan. 25 - Continental drift and the plate tectonics "revolution"
   Stanley, p. 129-141
   Prothero & Dott, 2010, p. 319-330

Fri., Jan. 27 - No Lecture?
   Study for 1st Quiz

*Mon., Jan. 30 - 1st QUIZ + Plates, plate boundaries, & plate movement
   Dietz, Sci. Amer. #899 (Wilson book)
   McCarthy & Rubidge, p. 22-25, p. 32-50, p. 52-57

Wed., Feb. 1 - Plate tectonics and Phanerozoic Earth history
   Dietz & Holden, Sci. Amer. #892 (Wilson book)
   Bambach et. al., p. 86-98 (Skinner book)

Fri., Feb. 3 - Plates, terranes, and the history of life
   Jones et. al., p. 70-84
   Hallam, Sci. Amer. #903 (Wilson book)

Mon., Feb. 6 - Precambrian plates and supercontinent cycles
   Prothero & Dott, 2010, p. 155-158
   Kerr, 1989, p. 529-530
   Kerr, 1997, p. 613-615
   Rogers and Santosh, 2002, p. 5-19
   McCarthy & Rubidge, p. 148-162, p. 186-195, p. 244-251

Wed., Feb. 8 - Sediments and sedimentary environments
   Eicher, p. 20-32
   McCarthy & Rubidge, p. 64-65, 72-73, 82, 98-100, 162-163

*Fri., Feb. 10 - 2nd QUIZ + Sedimentary structures and diagenesis
   Eicher, p. 32-35
   Newton & Laporte, p. 21-26
   McCarthy & Rubidge, p. 86-87

Mon., Feb. 13 - Sedimentary facies
   Prothero & Dott, 2010, p. 75-80

Wed., Feb. 15 - Unconformities
   Eicher, p. 45-51
   Prothero & Dott, p. 82-83

*Fri., Feb. 17 - 1st HOUR EXAM (15%)
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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Authors/References</th>
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<tr>
<td>Mon., Feb. 20</td>
<td>Discuss corrected exams and catch up</td>
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<td>Fri., Feb. 24</td>
<td>Relative age dating</td>
<td>Stokes, p. 72-82</td>
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<td>*Fri., Mar. 2</td>
<td>3rd QUIZ + Absolute age dating II</td>
<td>Prothero &amp; Dott, 2010, p. 94-100</td>
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<td>Mon., Mar. 5</td>
<td>Fossils - preservation, usefulness, and classification</td>
<td>Ausich &amp; Lane, p. 19-20, pp. 33-47, McCarthy &amp; Rubidge, p. 204</td>
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<td>Fri., Mar. 9</td>
<td>Patterns from the fossil record</td>
<td>Freeman &amp; Herron, 2001, pp. 521-536</td>
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<td><strong>SPRING VACATION</strong></td>
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<td></td>
<td></td>
<td>McCarthy &amp; Rubidge, pp. 61-63, pp. 66-70, pp. 74-75</td>
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<td>78-81, 83-85, 89-91, 94-99, 101-112, 118, 121-145</td>
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<td></td>
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<td>pp. 412-430</td>
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<td>pp. 374-376, pp. 438-440</td>
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<td>pp. 199-202</td>
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<td>*Fri., Mar. 30</td>
<td>2nd HOUR EXAM (15%)</td>
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<td>Mon., Apr. 2</td>
<td>Discuss corrected exams and catch up</td>
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Wed., Apr. 4 - Evaporites, salt domes, coastal plains, fault basins
   Martinez, 1991, p. 420-431
Fri., Apr. 6 - Pleistocene glaciation and Greenhouse-Icehouse cycles
   Prothero & Dott, 2010, p. 462-480
   Broecker and Denton, p. 49-56
Mon., Apr. 9 - Origin and Precambrian evolution of life
   Cowen, 2004, p. 6-14, p. 22-36, p. 42-46
Wed., Apr. 11 - Precambrian-Cambrian boundary & origin of metazoans
   Prothero & Dott, 2010, p. 185-201
   Freeman & Herron, 2001, p. 511, p. 516-520
   McCarthy & Rubidge, p. 176-183
*Fri., Apr. 13 - 5th QUIZ + Patterns of invertebrate evolution
Mon., Apr. 16 - Extinctions and "living fossils"
   Newell, Sci. Amer. #867 (Laporte book)
   Stokes, p. 500-511
   McCarthy & Rubidge, p. 298-300
Wed., Apr. 18 - Evolution of higher plants and origin of vertebrates
   McAulester, p. 89-107
   Bone, p. 1-16
   McCarthy & Rubidge, p. 216-222
Fri., Apr. 20 - Fish evolution
   McAulester, p. 78-85
Mon., Apr. 23 - Amphibians and early reptiles
   McAulester, p. 85-88, p. 108-117
   McCarthy & Rubidge, p. 223-234
Wed., Apr. 25 - Dinosaurs vs. early mammals
   McAulester, p. 117-131
   McCarthy & Rubidge, p. 234-239
*Fri., Apr. 27 - 6th QUIZ + Cenozoic mammals and birds
   Prothero & Dott, 2010, p. 444-457
   McCarthy & Rubidge, p. 240-241, p. 277
Mon., Apr. 30 - Evolution of humans and Pleistocene mammal extinctions
   McAulester, p. 137-154
   Prothero & Dott, 2010, p. 484-491
   McCarthy & Rubidge, p. 276, p. 277-295
Wed., May 2 - Resources & the environment, + Should you become a geology major?
   Prothero & Dott, 2010, p. 500-517
   Kerr, 1998, p. 1128-1131
   McCarthy & Rubidge, p. 309-317
Fri., May 4 - Review for Final Exam on Mon., May 14th (30%) + Course evaluation