G121: METEORITES AND PLANETS

Course Outline and Logistics for Spring, 2012

ATTENDANCE IS YOUR RESPONSIBILITY (AS AN ADULT IN COLLEGE)

Class 27064 01:25 - 02:40 p.m. MW GY 126

Principal Text:
McSween: Meteorites and Their Parent Planets (2nd Ed. 1999)

Additional assignments from:
2. Grotzinger and Jordan: Understanding Earth (2010; 6th Ed)
3. Feynman: Surely You're Joking, Mr. Feynman (Bantam ed., 1986)

These are on reserve in the Geology Library. IU Publishing will have a course-pack with the relevant pages from these assignments.

“STUDY” means a lot more than a quick cursory reading

LECTURE SCHEDULE AND STUDY ASSIGNMENTS

1. M Jan 9 Introduction; course outline; "what, where, when, how, & why" in science and in this course; faces of planetary bodies; minerals, rocks, fossils.  
2. W Jan 11 Impact cratering: some terms; diverse scales, multi-ringed basins, calderas.  
   Study: McSween: p. 15-36; Hartmann: p. 249-257 QUIZ

M Jan 16 Martin Luther King Day Class Does Not Meet

3. W Jan 18 Impact cratering: energy considerations; crater degradation. QUIZ  
   Study: Hartmann: p. 257-261; Wear colorful clothes on Wednesday Jan 25
4. M Jan 23 Relative ages, crater counts; ages of planetary surfaces.  
   Study: Hartmann: p. 249-261 Wear colorful clothes on Wednesday Jan 25
5. W Jan 25 Remote sensing; reflectance spectra; asteroids, moons and planets. QUIZ TODAY: Wear colorful clothes today.  
   Study: Grotzinger & Jordan: p. 56; 63-65.
7. W Feb 1 Properties of meteorites and basic classification. QUIZ
Study: McSween: p. 7-14
8. M Feb 6 Chondrites - age; chemistry; texture.
Study: McSween: p. 40-67
W Feb 8 EXAMINATION I
10. W Feb 15 Achondrites - planetary heating; fractional crystallization of silicate melts. **QUIZ**
11. M Feb 20 Achondrites - planetary heating; fractional crystallization of silicate melts.
12. W Feb 22 Achondrites - differentiated bodies. **QUIZ**
    Study: McSween: p. 126-136; 205-206
13. M Feb 27 Rocks from differentiated bodies; spectral reflectance of Vesta.
    Study: McSween: p. 162-167
14. W Feb 29 Geology of Mars. **QUIZ**
    Study: McSween: p. 176-181; and, consult any recent book in the Geology Library.
15. M Mar 5 Rocks of the Earth, Moon, Mercury, Venus, and Mars.
    **Do not cut class; take good notes**
W Mar 7 EXAMINATION II
16. M Mar 12 Cooling rates, planet size, and internal processes of terrestrial planetary bodies.
17. W Mar 14 Planet Earth - seismic activity; equations for P & S waves; density and rigidity of interiors of planets. **QUIZ**

**SPRING BREAK – Our class will NOT meet on Mon March 19 and Wed March 21**

18. M Mar 26 Planet Earth - core dynamo; magnetosphere; rock magnetism.
19. W Mar 28 Planet Earth - plate tectonics. **QUIZ**
    Study: Grotzinger & Jordan: p. 29-39; esp. fig. 2.8
20. M Apr 2 Mercury, Venus, Earth, Mars Revisited.
    **Do not cut class; take good notes**
21. W Apr 4 Genetic classification of meteorites. **QUIZ**
W Apr 11 EXAMINATION III
23. M Apr 16 Life on Mars - the debate through the centuries.
    Study: Grotzinger & Jordan: 300-302.
    http://cass.jsc.nasa.gov/lpi/meteorites/mars_meteorite.html
    http://www.soest.hawaii.edu/PSRdiscoveries/
    http://www.psrd.hawaii.edu/Oct96/LifeonMars.html/
24. W Apr 18 Evolution of life on Earth **QUIZ**
Study: Dott and Prothero: p. 43; 48-64.

25. M Apr 23  Mass extinctions on Earth

26. W Apr 25  Review

FINAL EXAMINATION: 12:30 p.m. – 2:30 p.m. Friday May 4 (This Room)

EXAMINATIONS AND GRADING

Grading will be on an "A-F" scale; "S-F" will not be permitted and an "I" will be allowed only for medical reasons and extremely extenuating circumstances.

We will have OPEN BOOK OPEN NOTES quizzes and examinations as in the schedule. The quizzes will add up to 20% of the course grade, for which we will use the best 8 scores. We will drop the scores of the rest of the quizzes; the drops will include all absence that will be assigned a score of 0 (zero). Three intra-term comprehensive OPEN BOOK OPEN NOTES examinations, each worth 20% of the course grade (i.e., 60% for three) will be given during the semester. The FINAL lecture examination, also OPEN BOOK OPEN NOTES, will also be comprehensive and will constitute 20% of the course grade. Students are strongly encouraged to participate in discussions and submit optional homework; marginal adjustment of letter grades may be made depending on contribution to class discussions and homework (no guarantee). MATERIAL DISCUSSED IN THE CLASS, WHETHER IN THE READING ASSIGNMENT OR NOT, WILL BE IN THE QUIZZES AND EXAMINATIONS.

OTHER INSTRUCTIONS and EXPECTATIONS

ON THE FIRST DAY OF CLASS:
1. Fill out address slips
2. Form study groups
3. See Basu if you have serious problems with quiz dates.

ATTENDANCE is your responsibility; we discuss contemporary topics and discoveries in solar system exploration that are NOT in the reading assignment. Except for Feynman, material within the pages of reading assignment but not discussed in class will not be in the examinations.

REQUIRED: Clipboard binder to keep all handouts that you print from Oncourse Resources. Bring all handouts and notes to every class meeting. STUDY (= read) notes in advance of class time; we will combine the traditional lecture-format with a discussion-format.

NOTE TAKING:
You will have lecture outlines and some facts for every class through ONCOURSE. Please print the day’s lecture outlines (or save in a laptop) and bring to class to take notes. Put the hardcopies in a three-ring binder in sequential order for review before quizzes and to assist in writing papers. You may use a laptop or a similar e-device to take and retain notes, but NOT for communication through the internet, e-mail, text-messaging etc. Printed handouts will NOT be distributed after this first class.
**Take good notes:** You must write down whatever is written or drawn on the chalkboard; use the handouts to take notes in the class; rewrite notes as soon as possible after class. See me during office hours to check the 'goodness’ of your notes.