Whole Earth Geophysics - Geology 310

Instructor - Dr. Arlo Weil
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Official office Hours – Open Door
Class meeting time –T,TH – 10:00 am – 11:30am; **Class location** - 259 Park

Course Web Page: http://www.brynmawr.edu/geology/310/

Required reading: *Weekly readings will be on reserve at the library*

Grading:

• Three TAKE-HOME exams	~30%
• Homework exercises	~50%
• One topical research paper	~15%
• Oral presentation	~5%
Total	100%

Class Objective: This class is designed to give the undergraduate geology student a fundamental understanding of the physical phenomena that governs how our Earth works. Topics will include, but are not limited to, learning about the Earth as a celestial body, the Earth's gravitational field, what drives plate tectonics, heat transport, seismology, earthquakes, paleomagnetism, geomagnetism, geochronology, geodynamics and much more.
Ultimately, I hope that this class will give the student a comprehensive overview of the principles of whole Earth geophysics. Although mainly focused on the theoretical side, some attention will also be given to the applied. This class is intended for the junior-level geology major that has a basic knowledge of geology, and experience with algebra and calculus based science courses.

Homework: Topical assignment will be given out to the class approximately once every-other week. All assignments are required and are due the following week. Each assignment will compliment the material being covered in lecture. The problems will mostly be quantitative in nature. The problem sets make up a large portion of the students grade. Students are free to work together in teams – as long as all students are participating in the deductive process.

Oral Presentations: A formal 30 minute lecture will be required from each student that will cover a topic in geophysics that the student chooses. The lectures should be well prepared and accompanied by detailed lecture notes, a reading list, and presented with some kind of multimedia (overheads, slides, powerpoint, etc.).

Exams: Three midterm exams will be given. Test format will be short answer and problem solving. All material on the test will come from the lectures and the homework assignments.

Paper: An eight-page topical research paper is required on a geophysics topic that is of interest to YOU. Topics will be discussed as the term progresses. A more detailed description of the paper will be given out at a later time during the semester.

Geophysics – 310 Calendar

Dates	Subject	Reading
Week 1 Aug 31 - Sept 4	• Introduction • The Earth and our Solar System	• Lowrie Chap. 1
Week 2 September 7 - 11	• Plate Tectonics • Triple Junctions	• Fowler Chap. 2
Week 3 September 14 - 18	• Geomagnetism	• Butler Chap. 1
Week 4 September 21 - 25	• Rock Magnetism	• Lowrie – 5.1 – 5.3
Week 5 Sept 28 – Oct 2	• Paleomagnetism	• Lowrie – 5.6 – 5.7
Week 6 October 5 - 9	**FIRST EXAM** • Gravity and Isostasy	• Lillie Chap. 8
Week 7 October 12 - 16	**FALL VACATION**	
Week 8 October 19- 23	**Second Exam** **GSA National Meeting**	
Week 9 October 26 - 30	•Seismology	• Fowler – 4.1 & 4.2
Week 10 November 2 – 6	•Reflection and Refraction Seismology	• Lowrie - 3.6
Week 11 November 9 - 13	•Internal structure of the Earth	• Lowrie - 3.7
Week 12 November 16 - 20	• Heat Flow	• Lillie Chap. 10
Week 13 November 23 - 27	• Geochronology **Thanksgiving Vacation**	• Fowler Chap 6
Week 14 Nov 30 – Dec 4	• Oral presentations	• Chap 5.6
Week 15 December 7 – 10		
Week 16 December 14 – 18	**EXAM WEEK**	