

## **GEO 1410/GEO 3410: Applied Geophysics, William Harbert**

Overview: Principles of various geophysical methods and their application to geologic problems.

Prerequisites: Geology (suggested but not required classes taken before this course include Calculus, and two terms of Physics). 3 credits.

Office Hours: Office Hours are 1-2 PM Mondays and Wednesdays or by appointment.

Textbook: *An introduction to geophysical exploration*, Philip Kearey, Michael Brooks, Ian Hill, Blackwell Publishers.

**Course Goals:** To give students an understanding of the physical principles of geophysical methods so that they will appreciate the strengths and limitations of the methods. After certain fundamentals have been mastered, the students study the procedures used in data acquisition and use the department's equipment to conduct geophysical surveys. The final phase of each section of the course gives students training in interpretation of geophysical data.

**Website:** [courseweb.pitt.edu](http://courseweb.pitt.edu) will contain this course. All assignments, lecture notes, and study guides will be posted. The format of documents will be in Word or PowerPoint. Check [courseweb.pitt.edu](http://courseweb.pitt.edu) for announcements such as newly posted material, exam times, and class cancellations.

**Disability:** If you have a disability for which you are or may be requesting accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 216 William Pitt Union 412-624-7890 as early as possible in the term.

**Academic Integrity:** All students are expected to adhere to the Academic Integrity Policy of the University pertaining to cheating and plagiarism. Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, noted below, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz, exam or paper will be imposed.

Section 1 Introduction to Geophysics -Methods, Units, Applications, Geophysical Societies, Geophysical literature

Section 2 Gravity methods

Section 3 Magnetic methods

Section 4 Radiometric, EM and Electrical Methods and Surveying

Section 7 Wireline log related methods

Section 5 Seismology and rock physics fundamentals

Section 6 Reflection and refraction seismology

## Section 8 Plate tectonics and crustal structure

### Graduate Course Grading:

10% Take home Midterm / 15% In class midterm /25% Final / 10% Thesis related presentation/ 20% Homework / 20% Project

### Undergraduate Course Grading:

10% Take home Midterm / 15% In class midterm /25% Final / 50% Homework

Extensive computer-based homework will be assigned. Students will work with Seismic Micro Technologies and Schlumberger Petrel software packages.

Datasets used will include: Magnetics DNAG and USGS High resolution aeromagnetic surveys. Electromagnetic US DOE multi frequency helicopter datasets.

Gravity: DNAG and USGS High resolution suveys.

Seismology: Geophysical reflection seismic pre-stack, 2D ODP transect.

*In this course, students, faculty and guests represent diverse perspectives, backgrounds, and experiences, which enriches our classes. Individuals of all races, colors, ancestries, sexes, marital status, familial status, ages, backgrounds, beliefs, ethnicities, gender identities and expressions, national origins, religious or political affiliations, sexual orientations, abilities, and other visible and nonvisible differences are welcomed. Every person in this classroom should feel responsible for creating a space that is intellectually rigorous and is a respectful, welcoming and inclusive environment for every individual. We urge all to be mindful of the ways that our identities position us in the classroom. While intellectual disagreement may be constructive, no harsh statements, or demeaning or discriminatory behavior will be permitted. If you feel uncomfortable, please feel free to approach me to discuss the situation.*

*In this class, we will have the chance to indicate the name that we prefer to be called and, if we choose, to identify pronouns with which we would like to be addressed. I will do my best to address and refer to all students accordingly and support classmates in doing so as well. I will endeavor to use gender-inclusive and nondiscriminatory language in all course communication and materials. Your suggestions for how to improve the effectiveness of the course for you personally or for other student groups are encouraged and appreciated. Our faculty is committed to communication from students without judgement. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.*