

# GEOL345 - Internal Earth Processes Syllabus

Spring 2012

Lecture: Tue-Th 11:00-12:15 PHRC114 (Public Health Research Center)

Section 1 Lab: Mon 12:30-4:30 EWS208

Section 2 Lab: Tue 3:30-6:30 EWS208

Section 3 Lab: Fri 1:30-4:30 EWS208

This course provides a survey of geophysical and geochemical approaches to understanding the state of the solid earth, its genesis and evolution. Course content is at the intermediate level, so students are expected to have completed an introductory level course in geology, as well as GEOL202 or a similar course in mineralogy. Students should also have completed or be concurrently registered in MATH122 or MATH141. The main objective of this course is to learn how modern geophysical and geochemical methods are used to investigate the nature of the earth's deep interior. Students will also be required to use library research tools for geoscientists (e.g. GeoRef, Science Citation Index), to investigate a research topic of their choice and present a poster on the results of their research.

## Instructors

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## Graduate Teaching Assistant

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## Textbooks, Readings and Blackboard

Because there is not a single textbook that adequately covers all aspects of this course, there is no required textbook for this class. Readings may be assigned out of a variety of sources and will generally be provided in the form of pdf's that will be posted to Blackboard. If you are interested in the subject matter for this course, and would like to purchase a textbook, we can recommend the following as good choices.

Philpotts AR and Ague, JJ, *Principles of Igneous and Metamorphic Petrology*, 2009, Second Edition, Cambridge University Press, New York, 667 p.

Fowler, CMR, *The Solid Earth: An Introduction to Global Geophysics*, 2004, Second Edition, Cambridge University Press, New York, 704 p.

## Learning Outcomes

Students completing this class will learn...

- how the solid earth formed and has evolved over its 4.55 Ga history
- how magmas form and evolved in different plate tectonic systems
- to interpret geochemical data in the context of the common igneous processes
- to identify igneous rocks and minerals in hand specimens and thin sections
- to identify the character of the Earth's physical and compositional layers
- how the Earth's magnetic field is generated and changes over time
- how the lithosphere moves and evolves

**Grades:** Course grades will be assigned on a curve. Course grades will be based on a curve. The extent of the curve depends on class performance but in general, we find that the average course grade for GEOL345 is a low B. There will be two equally weighted lecture exams. The first will be given the week following spring break. The second will be given in the scheduled final exam time slot. Labs and home works will be weighted equally. The value of a quiz will be twice that of a lab. The overall weighting of course work and key dates are listed below.

Lab Exam	10% (week of February 28 <sup>th</sup> in lab)
Lecture Exam 1	20% (March 15 <sup>th</sup> in class)
Lecture Exam 2	20% (April 30 <sup>th</sup> at 9:00 AM)
Poster Presentation	20% (week of April 16 <sup>th</sup> in lab)
Labs, Quizzes & Home Works	30%

## Attendance & Absence

Our attendance policy is that of the university: "Absence from more than 10 percent of the scheduled class sessions, whether excused or unexcused, is excessive and the instructor may choose to exact a grade penalty for such absences." Class attendance will be taken periodically. Students who are found to be absent from 3 classes or more will exceed this "10% rule" and will be subject to a penalty of up to one full course grade. Absence on an exam day will result in a grade of zero for that exam. Early exams can be arranged if you notify the appropriate instructor in person or by email one week prior to the exam date. Lab attendance is mandatory and essential to the successful completion of this class. If you know in advance that you cannot attend a particular lab date, you should arrange in advance to attend another lab section meeting that week.