GEOL345 Igneous and Metamorphic Processes

Spring 2017
Lecture: Tue-Thur 10:05-11:20am  EWS 209
Lab: Section#1: Tue 2:50-5:50pm EWS208; Section#2: 12:00-3:00pm EWS208

This course is a survey of igneous and metamorphic processes and their role to the formation and evolution of the solid-earth. Course content is at the intermediate level, so students are expected to have completed an introductory level course in geology, as well as GEOL302/202 or a similar course in mineralogy. Students should also have completed or be concurrently registered in MATH122 or MATH141. The main objective of the course is to learn how modern methods in, mineralogy, petrology, geochemistry and volcanology, combined with related areas of geophysics (e.g., heat flow, isostasy, seismic tomography) are used to understand the formation and evolution of the solid earth. The laboratory component of the course focuses on the identification of the common igneous and metamorphic rocks and minerals, and the acquisition, presentation and interpretation of petrological and geochemical data.

Instructor
Michael Bizimis, PSC 519A
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OFFICE HOURS from 1:30-2:30 on Tue-Thu or by appointment

Graduate Teaching Assistant
Paul Béguelin, PSC 518
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Textbooks, Readings and Blackboard
There is no required textbook for this class. Readings may be assigned out of a variety of sources and will generally be posted to Blackboard. If you are interested in the subject matter, particularly if you plan to continue to graduate school, a good petrology textbook is highly recommended. There are many choices out there, some recommendations are:


Other Resources:
The ability to use Microsoft Excel in the class and the lab is required, either through laptop or tablet. Otherwise some classes will have to take place in the computer lab, which is not optimal.
Learning Outcomes
Students completing this class will learn the following:
- how the solid earth formed and has evolved over its 4.55 Billion Year history
- how magmas form and evolve in different plate tectonic systems
- how metamorphic rocks form and evolve under different pressure-temperature conditions
- how geophysical data from isostasy, seismic, and heat-flow studies bear on igneous and metamorphic rock-forming processes in different plate tectonic settings
- to interpret petrological and geochemical data in the context of common igneous and metamorphic processes
- to identify the common igneous and metamorphic rocks and the minerals they contain in hand specimens and thin sections

Grades: The overall weighting of course work is listed below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weighting</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Lecture Exam 1</td>
<td>15%</td>
<td>Tuesday January 31st</td>
</tr>
<tr>
<td>Lecture Exam 2</td>
<td>15%</td>
<td>Thursday February 23rd</td>
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<tr>
<td>Lecture Exam 3</td>
<td>15%</td>
<td>Thursday March 30th</td>
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<tr>
<td>Lecture Quizzes</td>
<td>10%</td>
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<tr>
<td>Lecture Final</td>
<td>20%</td>
<td>Thursday April 27th at 9:00 am</td>
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<tr>
<td>Labs and Lab Quizzes</td>
<td>20%</td>
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<tr>
<td>Laboratory Final</td>
<td>20%</td>
<td>Thursday April 27th at 12:30 pm / TBD for Sec#2.</td>
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Notes on Grading:
#1. The lowest grade of the three Lecture Exams 1,2,3 will be dropped in the calculation of your final grade.
#2. Quizzes will be ~5-10 minute questions given randomly during some class lectures. Each quiz receives 8 points for participation and 10 points for correctness. The point of the quizzes is to judge what you know, stimulate discussion, and retain a record of attendance.
#3. The final grade may or may not be curved, depending on class performance and grade distribution. This will be decided late in the semester.
#4. Final Exam is on April 27th at 9:00 am.

Attendance & Absence
See the academic bulletin regarding attendance
http://bulletin.sc.edu/content.php?catoid=52&navoid=1280#Attendance_Policy

Attendance is highly recommended. The material is not difficult but it will often be much different than anything else you have done so far, so being in class and asking questions and making sure you understand the material as it is being presented is paramount. Same thing for the lab. The goal is to be able to complete most, if not all, your lab assignment within the time allotted for the lab.

Remember: **ASK QUESTIONS in class!** No better way to learn.

Attendance to lectures will be monitored through the administration of frequent in-class quizzes. No opportunities are provided to make-up missed quizzes. However, the quiz grade (attendance) will be curved at the end of the class.

If you have a significant academic conflict, early exams can be arranged if you notify the appropriate instructor in person or by email at least one week prior to the exam date. If you
are sick or have an emergency and cannot attend a lecture exam, you must notify me by email immediately. Failure to do so will result in a grade of zero for the exam. Lab attendance is mandatory and essential to the successful completion of this class. If you miss a lab meeting due to an emergency, you must contact the lab instructor to arrange a makeup immediately. Requests for more than one (1) makeup lab may or may not be granted, depending on the situation and it is up to the instructor to decide. This is to avoid habitual absence or lack of adequate planning from your side.