SYLLABUS
GEOL 2312 – Igneous and Metamorphic Petrology
Fall 2016

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Course Objectives: In this class, we will consider the description, classification, mineral and chemical composition, petrogenesis, and tectonic setting of igneous and metamorphic rocks. Lectures will consist of powerpoint presentations that focus on the principles and theories behind the origin of igneous and metamorphic rocks. Lab sessions will involve hands-on activities focused macroscopic and microscopic observations of various petrologic rock suites. A particular focus of the lab (and the topic of a final lab report) will be petrographic study of samples from the Sonju Lake mafic layered intrusion.

Textbook:
An Introduction to Igneous and Metamorphic Petrology
by John D. Winter, Prentice Hall, second edition, 2010
Support Website: http://www.whitman.edu/geology/winter/

Recommended Textbook:
An Introduction to the Rock-forming Minerals
by Deer, Howie and Zussman, Pearson, 1992

Lectures: Monday and Wednesday 10-11:15 AM, Chem 206

Labs: Section 02 - Tuesday and Thursday, 10-11:50 AM, Heller Hall 118
Section 03 – Tuesday and Thursday, 8-9:50 AM, Heller Hall 118
**Computer Lab:** Some lab and homework exercises will require access to computers in the Geology Computer lab (HH108). Password is your *x500*. You may also use these computers for other classwork this semester.

**After-hours Lab Access:** We will be the only class using this lab this semester and you are encouraged to use the lab any time, day or night. Everyone should have FOB access to the lab.

**Attendance:** Expected - although the lectures will largely follow the textbook, it will be important to attend lectures as the midterm and final exams will be based largely on lecture powerpoints. It is even more important that you attend all the lab sessions, as these will involve brief lectures and hands-on work. It is likely that not all lab exercises can be completed during the allotted time. Therefore, you should expect to spend additional time in the lab.

**Lectures:** Most lectures will be given as powerpoint lectures, which will linked to the class website on the day of the lecture.

**Lecture Quizzes:** A total of ten short quizzes will be given on Mondays (see schedule on website). The quizzes will be multiple choice and matching and will involve questions related to chapters in the textbook to be read BEFORE those subjects will be discussed in lecture. The lowest 2 quiz grades will be dropped from the final score.

**Homework Exercises:** A total of five homework exercises will be assigned during the course. These exercises are intended to give you a more applied understanding of the concepts and principles of petrology. The homework exercises will typically be due one week after they are assigned.

**Lab Exercises:** Most lab sessions will require completion of petrographic reports or a worksheet. I will give brief lectures at the onset of each new exercise to give background information and explain what is expected. The TA’s and I will be available to answer any questions you may have. You will be notified of the due date for the exercise when it is assigned (usually one week).

**Lab Computer:** Occasionally, petrographic data collected for a lab exercise will need to be entered into a spreadsheet on the lab Mac computer or photomicrographs may be taken with the instructor microscope. These can be stored in the GEOL3212_16 folder on the desktop.

**Late Penalties:** There is a lot of content to be covered in this course. In order to motivate you to keep up with coursework, there will be substantial penalties for late assignments. Lab and homework exercises that are turned in up to two weeks after the due date will receive a 15% reduction in grade. Exercises will not be accepted beyond two weeks after the due date. Permission to turn in assignments late will only be granted for special circumstances and must be requested in advance of the due date.
Field Trip: You will be required to attend a two-day field trip for full credit. The geological focus of the trip will be Midcontinent Rift geology of the North Shore and will include a traverse of the Sonju Lake Intrusion. The SLI traverse will provide field information that you will include into your Sonju Lake Report (see below)

Date: Saturday & Sunday, April 23-24
- Overnight camping at Finland State Campground
- Meals will be provided; there may be grub and camping Fee
- Transportation will be by two Turtletop vans

Report on the Sonju Lake Intrusion: At the beginning of the semester, lab exercises will focus on acquiring petrographic data from the samples collected from the Sonju Lake Intrusion near Finland, MN. The data you collect from these samples will be merged with petrographic data collected by your classmates. At the end of the semester, this petrographic data, and geochemical data you will be given, will be used to model the petrogenesis of the SLI. You will be required to summarize your study of the SLI in the form of a technical report. More information about the content of this report will be given over the course of the semester.

Extra Credit: Up to 10 points of extra credit may be gained in two ways.
1) You can earn 1% extra credit for each department seminar you attend and commenting on. Semi-weekly EES department seminars are held on Thursdays at 4:00 PM in Marshall W. Alworth Hall (MWAH) Room 191. Seminar topics will be announced in class and posted on the webpage. To receive credit, you must submit a half-page summary of what you learned from the seminar topic on the following lecture day.
2) You can earn 2% extra credit points for reading and commenting on a petrology article published in the journal *Elements*. These articles will be posted on the class website. For each paper, you will be required to write a short evaluation (approximately 500 words, or up to 2 pages, double-spaced).

Grading: Scores for the various components of the class will be weighted as follows:
- Lecture Quizzes 10%
- Lab Exercises 30%
- Sonju Lake Report 10%
- Homework Exercises 10%
- Field Trip Attendance 5%
- Midterm Exams 20% (10% each)
- Final Exam 15%

Letter grades will be based on the following range of total class percentage scores:
- A (Outstanding) 100-95% C+ (Average) 75-70%
- A- (Outstanding) 95-90% C (Average) 70-65%
- B+ (Above Average) 90-85% C- (Average) 65-60%
- B (Above Average) 85-80% D+ (Below Average) 60-55%
- B- (Above Average) 80-75% D (Below Average) 55-50%
- F (Failing) <50%

Students with Disabilities: Individuals who have any disability, either permanent or temporary, which might affect their ability to perform in this class are encouraged to inform the instructor at the beginning of the semester. Adaptions of methods, materials, or evaluations may be made as required to provide equitable participation.

*This syllabus is subject to change.*