LITHOLOGY 51-206, SPRING 2012 *(4 credits)*

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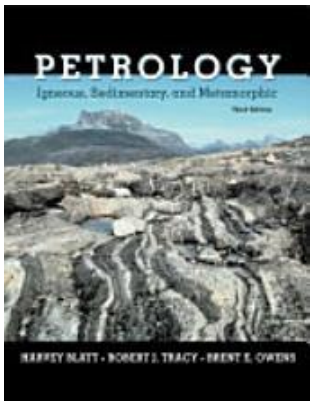
Office hours: Monday 3-4pm; Wednesday 1-2pm; Friday 9-10am; or by scheduled appointment

Class Schedule/Location:

Lectures:	MWF 11:30-12:30am	Harrington 217
Labs:		
	Tuesday A01L: 8:00-11:20am	Harrington 216
	Tuesday A02L: 1:50-5:10pm	Harrington 216

Textbook:



Blatt, H., Tracy, R.J., Owens, B.E. (2006). PETROLOGY: Igneous, Sedimentary, and Metamorphic, 3rd Edition. W.H. Freeman and Company, New York, NY 530 pages.

COURSE GOALS

The primary goals of this course are to train you in how to identify igneous, sedimentary, and metamorphic rocks, evaluate geochemical data, complete simplified geologic maps based on the occurrences of different types of rocks, and write professional-style reports based on your interpretations. In combination, the skills you obtain in this course are designed to prepare you to work for a geological survey, mineral exploration company, consulting firm, university, or as an independent consultant. This course will be challenging and require a concerted effort on your part to be successful. If you are unclear what is expected of you after reading this syllabus, please see me immediately so that I can clarify.

Some specific objectives:

- **Identify common igneous, metamorphic, and sedimentary rocks**
- **Predict the occurrence of igneous, metamorphic, and sedimentary rocks based on global, regional, and local tectonic associations and crustal evolution**
- **Describe the physical and chemical processes that lead to the production of magma**

- **Describe the compositional evolution of the earth and understand the processes that lead to the diversification of magmas (e.g. differentiation, magma mixing, and assimilation)**
- **Describe and quantify the P-T-t evolution of igneous and metamorphic rocks**
- **Relate the mineral and textural associations within a rock to a specific physical and chemical evolution**
- **Make a qualitative and quantitative analysis of magma properties that affect flow and eruption styles**
- **Describe the environment and processes of sediment production that ultimately lead to the formation of common sedimentary rocks**

Exams:
There will be three exams covering lecture materials. All of the exams on lecture material will be open-book, take-home exams. These exams will require you to think critically and synthesize the material rather than memorize a number of specific facts. These exams are ***NOT*** intended to be collaborative and, therefore, ***MUST*** be completed individually.

Exam 1	**IGNEOUS PETROLOGY**
Exam 2	**METAMORPHIC PETROLOGY**
Exam 3	**SEDIMENTARY PETROLOGY**

Homework assignments:
You will be given a number of homework assignments throughout the semester. These assignments will require variable amounts of time to complete. Most will be due within a week of their being assigned.

Week	***Homework Assignment***
Jan. 30	***Geothermal gradients***
Feb. 6	***Phase diagrams***
Feb. 13	***Stokes law and magma differentiation***
Feb. 20	***Enthalpy of magma crystallization***
Feb. 27	***Geothermometry***
Apr. 2	***Geothermobarometry***

Laboratory:

Rock and mineral identification quizzes:
There will be eleven weekly rock and mineral identification quizzes to start each lab period and one final quiz. The quizzes are cumulative – you are responsible for both new rocks and minerals and those previously covered. Mineral identification will remain a significant portion of the quizzes throughout the semester.

Laboratory assignments:
There will be six laboratory assignments.

Week	*Laboratory Assignment*
Feb. 13	***Petrography and Petrogenesis of a Mid-Ocean Ridge Lava Suite***
Feb. 20	***M&M magma chamber***
Feb. 27	***Petrography and Petrogenesis of Felsic Suite***
Mar. 5	***Viscosity experiments: physical controls on magma/lava movement and implications for volcanic hazards***
Apr. 2	***Geothermobarometry and petrographic analysis***
Apr. 30	***Sedimentary petrology***

Grade distribution:
A summary of the grade distribution for each component of the course is provided below:

Course component	% of overall grade
Lecture Exams	40
In-class assignments/ Homework	20
Weekly Rock/Mineral lab quizzes	20
Laboratory projects	10
Field Trip Field Book/Assignment	5
Final Lab Exam	5
Total course	**100**

Due dates:
Assignments must be submitted on the due dates that are given. ***Late assignments will not be accepted*** unless a special arrangement has been made sufficiently in advance of the due date.

Grades:
Your grade is based on the total points that you accrue over the course of the semester. The grade is weighted where approximately 60% is assigned to lecture exams and in-class/homework with the remaining 40% assigned to laboratory work, which includes the weekly rock/mineral identification quizzes and field trip.

Grading scale:
93% and up = A
90-92 = A-
87-89 = B+
83-86 = B
80-82 = B-
77-79 = C+
73-76= C
69-72 =C-
66-68 = D+
63-65 = D
60-62 = D-
<60% = F

Academic Integrity: The Wisconsin Administrative Code states: “Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others academic endeavors.” (§ UWS 14.01) Plagiarism and other forms of academic misconduct are serious offenses with severe penalties. See the University of Wisconsin Oshkosh Student Discipline Code for definitions of academic misconduct and details about procedures, sanctions, and other relevant information. Specific questions about the provisions in the Student Discipline Code should be directed to the Dean of Students Office. If you do not understand this statement, please see me as soon as possible.

Lecture and laboratory schedule (tentative)

Week	Topic	Readings
Jan. 30	Earth and its magmatism: The early evolution of the Earth, Compositional and petrological evolution of the crust and mantle	Chap. 3 and 7
Feb. 6	Origin of magmas through melting of the mantle and crust, chemistry and physics of magmas	Chap. 3 and 5
Feb. 13	Crystallization of magmas and chemical diversification (includes assimilation and magma mixing)	Chap. 6
Feb. 20	Magmatism at plate convergent boundaries	Chap. 9
Feb. 27	Granitic plutons and silicic ignimbrites	Chap. 4
Mar. 5	Oceanic and continental interior magmatism, continental flood basalts	Chap. 8 and 10
March 9, Friday	**FIRST MID-SEMESTER TAKE-HOME EXAM**	
Mar. 12	Introduction to metamorphism	Chap. 17
Mar. 19	**SPRING BREAK**	
Mar. 26	Properties of metamorphic rocks	Chap. 18
Apr. 2	Metamorphic reactions and assemblages	Chap. 19 and 20
Apr. 6, Friday	**SECOND MID-SEMESTER TAKE-HOME EXAM**	
Apr. 9	The occurrence of sedimentary rocks, weathering and soils	Chap. 11
Apr. 16	Limestones and Dolomites	Chap. 15
Apr. 23	Conglomerates, Sandstones, Mudrocks	Chap. 14
Apr. 28-29	**Fieldtrip (tentative)**	
Apr. 30	Evaporites, Chert, Iron-Rich Rocks, Phosphorites	Chap. 16
May 9, Wednesday	**THIRD AND FINAL SEMESTER TAKE-HOME EXAM**	