GEOSCIENCES 214: PETROLOGY SPRING 2007

Instructor: Mary Keskinen (NSci 340 - X 7769)
Teaching assistants: Mariah Tilman (GI-310 - X 1925) &
Allison Payne (NSci 312 - X 7585)
Class meetings: Lecture Monday & Wednesday, 11:45-12:45 (NSci 235)
Lab Monday/Wednesday, 2:15-5:15 p.m. or 6-9 p.m. (NSci 237)
MK Office Hours: Monday 9:30-10:30; Tuesday 3-4.

	LECTURES	READING ASSIGNMENTS
January	17 Structure and composition of the earth, general characteristics of igneous rocks	Blatt, pp.xvii-10, 136-149.
22	Mineralogical classification of igneous rocks	Blatt, 20-64.
24	Field characteristcs of igneous rocks	Blatt, 10-18, 71-90.
29	Phase rule and phase diagrams	Blatt, 92-103.
31	Binary systems & fractional crystallization	Blatt, 116-120.
February	5 Ternary systems & Bowen's Reaction Series	Blatt, 103-115.
7	Dealing with a more complex system: the real world	Blatt, 120-135.
12	Chemical classification of igneous rocks	Blatt, 65-69, 465-470. 14
	Geochemical clues: isotopes and trace elements	
19	Basalts, tectonics, and ophiolites	Blatt, 151-167.
	21 Continental volcanism	Blatt, 190-211.
26	Subduction and volcanism	Blatt, 168-180.
28	Granites and batholiths	Blatt, 180-189.
March	5 Very cool and cutting edge topics in igneous petrology	Guest lecturer
7	Igneous Petrology Exam	
	** SPRING BREAK **	
19	Metamorphic Processes	Blatt, 359-379.
21	Facies and Facies Series	Blatt, 339-357, Miyashiro 19-31.
26	Graphical Methods for Metamorphism	Blatt, 381-394; Best 401-408.
28	-as above-	
April	2 Metamorphic Reactions	Blatt, 396-409.
4	Quantitative Metamorphic Petrology	Blatt, 471-480.
9	Contact Metamorphism and Low P/T Facies Series	Blatt, 439-440, 447-462.
11	-as above-	
16	Regional Metamorphism: Mod P/T Facies Series	Blatt, 411-425, 427-439.
18	- as above -	
23	High P/T Facies Series: Blueschists & Eclogites	Blatt, 440-444.
25	Ocean-floor and Geothermal Metamorphism	
30	Isotopes & Trace Elements in Metamorphic Systems	Blatt, 482-497.
May	2 Petrotectonics	Hyndman, 657-664.
7	Review and Overview of Metamorphism	

FINAL EXAM: Friday, May 11 - 10:15-12:15

READING ASSIGNMENTS MUST BE COMPLETED BEFORE THE CLASS FOR WHICH THEY ARE ASSIGNED!

GRADING: The course is divided into two units: the first section dealing with igneous rocks, then metamorphic rocks will be covered. The homework assignments and lecture exams will constitute about 60% of your final grade. The laboratory grade is worth approximately 40% of the final grade.

REQUIRED TEXTBOOK:
Blatt, Tracy, & Owens (2006) Petrology (3rd Ed.) W.H. Freeman and Co., New York.

TEXTS FOR SUPPLEMENTARY READING ASSIGNMENTS:
Best, M.G. (1982) Igneous and Metamorphic Petrology. W.H. Freeman, San Francisco.
Hyndman, D.W. (1985) Petrology of Igneous and Metamorphic Rocks. McGraw-Hill, N.Y.
Miyashiro, A. (1972) Metamorphism and Metamorphic Belts. John Wiley, New York.

Assigned reading from books other than Blatt, Tracy, & Owens will be xeroxed and made available in the classroom (235).

LAB SCHEDULE FOR IGNEOUS AND METAMORPHIC ROCKS

January 22 Review of Optical Mineralogy
24 Minerals in Thin Section
29 Igneous minerals and textures
31 Igneous minerals and the microscope

February 5 M&M lab exercise, thin section preparation and the electron microprobe 7 Plutonic rocks I
12 Plutonic rocks and microscopes I
14 Plutonic rocks II
19 Plutonic rocks and microscopes II
21 Volcanic rocks in hand specimen
26 Volcanic rocks and microscopes
28 Pyroclastic rocks and volcano movies

March 5 - continuation of pyroclastic rocks -
7 Unusual igneous rocks in hand sample and thin section

** SPRING BREAK **
19 -no lab-
21 Metamorphic Minerals
26 Regional Metamorphic Rocks I - pelitic & carbonate rocks
28 Regional Metamorphic Rocks I - microscopic features

April 2 Regional Metamorphic Rocks II - mafic & ultramafic rocks
4 Regional Metamorphic Rocks II - microscopic features
9 Contact Metamorphism and Unfoliated Metamorphic Rocks
11 -as above-
16 Metamorphic Facies
18 -as above-
23 Igneous, sedimentary, and metamorphic rocks
25 Metamorphic review
30 Field Trip

May 2 Igneous and Metamorphic Rock Lab Exam