

GEOSCIENCES 214: PETROLOGY

SPRING 2008

Instructor: Mary Keskinen (Reic 340 - X 7769)

Teaching assistants: Leslie Almborg (GI - 310 - X 6171) &
Steve Polkowski (Reic 312 - X 7585)

Class meetings: Lecture Monday & Wednesday, 11:45-12:45 (Reic 235)

Lab Monday/Wednesday, 2:15-5:15 p.m. or 6-9 p.m. (Reic 237)

MK Office Hours: Monday 9:00-10:00; Tuesday 10:30-11:30.

LECTURES

READING ASSIGNMENTS

January	28	Structure and composition of the earth, general characteristics of igneous rocks	Blatt, pp.xvii-10, 136-149.
	30	Mineralogical classification of igneous rocks	Blatt, 20-64.
February	4	Field characteristics of igneous rocks	Blatt, 10-18, 71-90.
	6	Phase rule and phase diagrams	Blatt, 92-103.
	11	Binary systems & fractional crystallization	Blatt, 116-120.
	13	Ternary systems & Bowen's Reaction Series	Blatt, 103-115.
	18	Dealing with a more complex system: the real world	Blatt, 120-135.
	20	Chemical classification of igneous rocks	Blatt, 65-69, 465-470. 25
		Basalts, tectonics, and ophiolites	Blatt, 151-167.
	27	Continental volcanism	Blatt, 190-211.
March	3	Subduction and volcanism	Blatt, 168-180.
	5	Granites and batholiths	Blatt, 180-189.
** SPRING BREAK *			
	17	Very cool and cutting edge topics in igneous petrology	Guest lecturer
	19	Metamorphic Processes	Blatt, 359-379. 24 Igneous
		Petrology Exam	
	26	Facies and Facies Series	Blatt, 339-357, Miyashiro 19-31.
	31	Graphical Methods for Metamorphism	Blatt, 381-394; Best 401-408.
April	2	-as above-	
	7	Metamorphic Reactions	Blatt, 396-409.
	9	Quantitative Metamorphic Petrology	Blatt, 471-480.
	14	Contact Metamorphism and Low P/T Facies Series	Blatt, 439-440, 447-462.
	16	Regional Metamorphism: Mod P/T Facies Series	Blatt, 411-425, 427-439.
	21	High P/T Facies Series: Blueschists & Eclogites	Blatt, 440-444.
	23	Ocean-floor and Geothermal Metamorphism	
	28	Isotopes & Trace Elements in Metamorphic Systems	Blatt, 482-497.
	30	Petrotectonics	Hyndman, 657-664.
May	5	Review and Overview of Metamorphism	

FINAL EXAM: Friday, May 9 - 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. Letter grades and +/- grades will be given.

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	28	Review of Optical Mineralogy		
	30	Minerals in Thin Section		
February	4	Igneous minerals and textures		
	6	Igneous minerals and the microscope		
	11	M&M lab exercise, thin section preparation and the electron microprobe	13	Plutonic
		rocks I		
	18	Plutonic rocks and microscopes I		
	20	Plutonic rocks II		
	25	Plutonic rocks and microscopes II		
	27	Volcanic rocks in hand specimen		
March	3	Volcanic rocks and microscopes		
	5	Pyroclastic rocks and volcano movie		
		** SPRING BREAK **		
	17	Unusual igneous rocks in hand sample and thin section		
	19	-no lab-		
	24	Metamorphic Minerals		
	26	Regional Metamorphic Rocks I - pelitic & carbonate rocks		
	31	Regional Metamorphic Rocks I - microscopic features		
April	2	Regional Metamorphic Rocks II - mafic & ultramafic rocks		
	7	Regional Metamorphic Rocks II - microscopic features		
	9	Contact Metamorphism and Unfoliated Metamorphic Rocks		
	14	-as above-		
	16	Metamorphic Facies		
	21	-as above-		
	23	Igneous, sedimentary, and metamorphic rocks		
	28	Field Trip		
	30	Igneous and Metamorphic Rock Lab Exam		

COURSE DESCRIPTION:

Petrology and Petrography (Geosciences 214) covers the origin, occurrence, and classification of igneous and metamorphic rocks. The format involves 2 hours of lecture per week, largely devoted to more theoretical aspects of these topics, while laboratory work (6 hours per week) involves hand lens identification and thin section examination of representative rocks.

Disability Services: The Office of Disability Services implements the Americans with Disabilities Act (ADA) and insures that UAF students have equal access to the campus and course materials. This class will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities. Make sure to let the instructor know if there are concerns of this type.