1-2013

GEO 226.01: Rocks, Minerals & Resources

Julia A. Baldwin
University of Montana - Missoula, julie.baldwin@umontana.edu

GEO 226: Rocks, Minerals, and Resources

Instructor: Julie Baldwin
Office: CHCB 329, Phone: 243-5778
E-mail: julie.baldwin@umontana.edu
Office Hours: W 2:00-4:00, or by appt.

TA: Drew Cramer
Office: CHCB 101
E-mail: martin.cramer@umontana.edu
Office Hours: WF 2-3PM, in 348 or 110

Lecture Meetings: MWF 11:10-12:00 in CHCB 304
Lab: T 11:10-1:00 PM (section 1) and Th 11:10-1:00 PM (section 2) in CHCB 348

Course prerequisites: GEO101/102 and C- or better in college chemistry (CHMY141).

Course Website:
We will use Moodle for this course (https://umonline.mrooms3.net). Please check site for course announcements, lecture notes, and handouts.

Course Overview:
This course will introduce you to Earth materials, including their composition, structure, classification, and formation. Minerals are the building blocks of rocks and therefore help geologists interpret how the Earth formed and has evolved through time, making the study of minerals central to all disciplines in geology. A major goal of this course is to provide you with the necessary framework to understand and evaluate the information that minerals and rocks can provide about Earth processes and Earth history. Minerals and rocks are, of course, also important for understanding present-day Earth processes and have many practical uses in our society.

Course Objectives:

1) Identify minerals in hand sample and thin section and with the aid of various analytical techniques.
2) Introduce crystal chemistry and crystal structure and how these relate to a mineral's physical properties.
3) Introduce the tools that are used to identify and characterize minerals.
4) Learn how minerals form, what factors affect their stability, and why certain minerals form in association with other minerals in greater (or lesser) abundances
5) Describe mineral occurrences in relation to the rock cycle. Learn the common minerals in igneous, sedimentary, and metamorphic rocks, as well as in economic ore deposits and be able to name the rocks that these minerals occur in.

Textbook & Materials:
Required Text: Earth Materials, 1st ed., Klein & Philpotts
Bring to every class: class notebook (3-ring binder), colored pencils, straight-edge ruler, calculator, hand lens.

i>clickers
You are required to purchase an i>clicker remote for in-class participation. i>clicker is a classroom response system that allows you to respond to questions I pose during class, and you will be graded on that feedback and/or your in-class participation. In order to receive this credit, you will need to register your i>clicker remote online by start of class on **Feb. 4**. To register your iclicker, go to http://www.iclicker.com/support/registeryourclicker/. Complete the fields with your first name, last name, **NetID**, and remote ID. The remote ID is the series of numbers and

sometimes letters found on the bottom of the back of your i>clicker remote. i>clickers will be used every day in class, and you are responsible for bringing your remote daily – no exceptions. Handwritten responses will not be accepted.

Lab:
You are required to attend lab each week. There is a lab midterm and also a comprehensive lab final. You are always welcome to make up a missed lab in the other section.

Grading:
Your final grade will be based on the following grading scheme:

Midterms*	25%
Final Exam	15%
i>clicker participation	10%
Lab Assignments	25%
Lab Midterm	5%
Lab Final	10%
Hand Sample/Formula Quiz**	10%

* You may use your i>clicker average to replace your lowest midterm grade **IF** your i>clicker average is greater than or equal to 80%. This is your incentive to come to class and participate since midterm averages are typically in the 60's for this course.

** The hand sample and mineral formula quiz will be available to take starting March 1. You may take this quiz as many times as you want, but you must achieve a minimum score of 90% for it to count (e.g. if you get a 75 then you must retake it and achieve a 90% or better to receive any credit). There will be incentive extra credit bonuses for those who complete it early that will be explained in class. It must be completed by May 1.

SCHEDULE

Week	Date		Lecture Topic	Text Reading	Lab Topic
1	Jan.	28	Introduction	Ch. 1	
		30	Minerals, Rocks, and Plate Tectonics	Ch. 2	**None**
	Feb.	1	Minerals, Rocks, and Plate Tectonics	Ch. 2	
2		4	Mineral Identification	Ch. 3	Physical Properties
		6	Mineral Identification	Ch. 3	
		8	Crystal Structures	Ch. 4	
3		11	Crystal Structures	Ch. 4	Instrumental Techniques: SEM
		13	Crystal Structures	Ch. 4	
		15	Crystallography	Ch. 5	
4		18	**President's Day Holiday**		Instrumental Techniques: XRD
		20	Crystallography	Ch. 5	
		22	Crystallography	Ch. 5	
5		25	**EXAM 1**		
		27	Optical Mineralogy	Ch. 6	Crystalmaker
	Mar.	1	Optical Mineralogy	Ch. 6	
6		4	Optical Mineralogy	Ch. 6	
		6	Optical Mineralogy	Ch. 6	Optical Properties
		8	Igneous Minerals	Ch. 7	
7		11	Igneous Minerals	Ch. 7	
		13	Igneous Minerals	Ch. 7	Igneous Minerals
		15	Igneous Processes	Ch. 8	

8		18	Igneous Processes	Ch. 8	
		20	Igneous Processes	Ch. 8	**Lab Midterm**
		22	**EXAM 2**		
9		25	Igneous Rocks	Ch. 9	
		27	Igneous Rocks	Ch. 9	Igneous Rocks
		29	Igneous Rocks	Ch. 9	
10	Apr.	8	Sedimentary Minerals	Ch. 10	Sedimentary Minerals
		10	Sediment Formation & Transport	Ch. 11	
		12	Sediment Formation & Transport	Ch. 11	
11		15	Sedimentary Rocks	Ch. 12	Sedimentary Rocks
		17	Sedimentary Rocks	Ch. 12	
		19	Metamorphic Minerals	Ch. 13	
12		22	Metamorphic Minerals	Ch. 13	Metamorphic Minerals
		24	Metamorphic Minerals	Ch. 13	
		26	**EXAM 3**		
13		29	Metamorphic Rocks	Ch. 14	Metamorphic Rocks
	May	1	Metamorphic Rocks	Ch. 14	
		3	Economic Minerals	Ch. 15	
14		6	Economic Minerals	Ch. 15	Economic Minerals
		8	Resources	Ch. 16	
		10	Resources	Ch. 16	
	May	**14**	**Final Exam 10:10-12:10**	8-10	**Lab Final**

Policy for late work:
If you are having trouble completing an assignment on time, please come talk to me or the TA AHEAD of the due date. Otherwise, ***a penalty of 20% per day an assignment is late will apply***.

Academic Integrity:
All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.
All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://life.umt.edu/vpsa/student_conduct.php.