

MINERALOGY

Lecture: MWF 8:00-9:00
Lab: M 2:00- 4:00
Room: Bracy 127

Instructor: Mark McNaught
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OBJECTIVES:

1. To be able to identify common minerals.
2. To understand the geologic significance of important minerals.
3. To be able to use and interpret results from analytical tools used to study minerals.

GRADING:

Exam 1	14%	Labs and Quizzes	18%
Exam 2	14%	Lab Final	10%
Exam 3	14%	Lab Project	5%
Class Presentation	5%		
Final Exam	20%		

FINAL EXAM:

The final exam will be given on a day and at a time determined by the registrar. (Thur. December 16th at 6 PM). The Final Exam is CUMULATIVE.

TEXTBOOKS:

Hefferan and O'Brian, *Earth Materials*;
 Johnsen, *Minerals of the World*.

**OTHER NEEDED
 SUPPLIES:**

Index Cards

CLASS SCHEDULE:

A tentative schedule of lectures with reading assignments is attached. Exam dates are also indicated and these can be considered fixed.

LAB:

A tentative list of labs is included on the class schedule. Tentative dates for lab quizzes are also indicated. A lab final will be given the last week of the semester. Lab is an important part of this course. Students will be expected to spend time in lab outside of the assigned hours.

PROJECTS:

Part of the grade will be based on two research projects. One project will involve researching a group of minerals and presenting this material to the class. The second project will involve lab work to study and identify mineral unknowns. Details on both projects will be provided later.

ATTENDANCE:

Students are expected to ATTEND class. Students with more than 2 nonexcused absences maybe penalized 1 point on there final average for each additional absence.

ACADEMIC HONESTY:

Students are expected to follow University guidelines for academic honesty.

**STUDENT
 ACCESSIBILITY
 SERVICES:**

Any student with a documented disability needing academic accommodations is requested to speak with Student Accessibility Services (Room 113 Hoover-Price Campus Center) and the instructor, as early in the semester as possible. All discussions will remain confidential

<u>DATE</u>	<u>LECTURE</u>	<u>READ</u>		<u>LAB</u>
		Hefferan & O'Brian	Johnsen	
Aug. 30	Course Introduction,		p. 11-17	Crystal Growth
Sept 1	Crystallography- Symmetry	p. 85-101	p. 18-22	
3	Crystallography- External Form		p. 22-24	
6	Crystallography - Internal Order	p.75-85	p. 25-54	Crystallography
8	Crystal Chemistry	p. 19-31	p. 54-60	
10	Physical Properties of Minerals	p. 111-128	p. 60-73	
13	Crystal Chemistry	p. 31-42		Physical Properties of Minerals
15	Crystal Chemistry			
17	Crystal Structure			
20	Chemical Analysis			Min ID 1
22	SEM/EDS Intro			
24	EXAM 1			
27	Chemical Analysis			Crystal. Quiz, Mineral ID 2
29	Crystal Growth			
Oct. 1	X-ray Crystallography			X-ray Into, Min. ID Quiz I
4	X-ray Crystallography			
6	X-ray Crystallography			
8	Silicates	p. 42-45	p. 250-251	
11	Tectosilicates: Quartz	p. 134-140	p. 354-364	X-ray 1
13	tectosilicates: Feldspars	p.48-56	p. 265-374	
15	FALL BREAK			
18	FALL BREAK			X-ray 2
20	Other Tectosilicates		p. 375-394	
22	Phyllosilicates	p. 132-134	p. 331-345	
25	Phyllosilicates		p. 345-354	Mineral ID 3
27	Inosilicates	p. 131-132	p. 298-329	
29	EXAM 2			
Nov. 1	Cyclosilicates	p. 130-131	p. 287-297	Mineral ID 4
3	Neosilicates	p. 128-130	p. 253-273	
5	Sorosilicates		p.274-286	
8	Nonsilicates	p. 140-144		SEM Project
10	Presentations: Nonsilicates			
12	Presentations: Nonsilicates			
15	Optical Mineralogy	p. 145-157		Min. ID Quiz II, Project
17	Optical Mineralogy	p. 157-181		
19	Optical Mineralogy			
22	Optical Mineralogy			Optical Min 1
24, 26	THANKSGIVING BREAK			
29	Mineral Assemblages	p. 541-565		Optical Min 2, Project
Dec. 1	Mineral Assemblages	p. 565-579		
3	EXAM 3			
6	Lab Project Presentations			Mineral Lab Final
8	Lab Project Presentations			
10	TBA			

Mineral Identification Labs

As indicated on the syllabus four lab exercises this semester will involve learning to identify a series of common minerals. For preparation for each these exercises you will need to look up the properties for each mineral. There will be some reference books in the lab that you can use to look up mineral properties and you can use the internet (see the Useful Links Page on the course web site for places to look).

I suggest you make up an index card for each mineral. On one side of the card put the name of the mineral. On the other side of the mineral put the key physical properties that allow you to identify the mineral. You may want to sketch the mineral so you can remember what it looks like. Keep some room on the card so you can add properties when we go over the minerals later.

In lab the index cards you make will serve as your reference guide for identifying minerals. The cards will also serve as a study aid in preparing for quizzes and tests.

The minerals you need to look up for each exercise are listed in the four columns below. You will need to prepare your cards before each lab session.

Mineral ID 1	Mineral ID 2	Mineral ID 3	Mineral ID 4
Quartz Chert Potassium Feldspar Plagioclase Feldspar Nepheline Sodalite Stilbite Natrolite Chabazite Kaolinite Serpentine Talc Muscovite Biotite Lepidolite Chlorite	Prehnite Tourmaline Beryl Enstatite Diopside Augite Wollastonite Rhodonite Tremolite Actinolite Hornblende Olivine Almandine Grossularite Zircon Epidote Staurolite Andalusite Kyanite Sillimanite	Calcite Dolomite Siderite Rhodocrosite Aragonite Malachite Azurite Barite Celestite Gypsum Apatite Pyrite Pyrrhotite Chalcopyrite Bornite Galena	Sphalerite Cinabar Molybdenite Sulfur Graphite Copper Hematite Corundum Magnetite Goethite Halite Fluorite