

GEL 2440-1
Mineralogy
Fall 2005

Instructor: Matthew E. Brueseke (that's breeze-uh-key)
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Office hours:
M: 2:00-3:00 pm
R: 9:00 am-12:00 pm
F: 10:00 am-12:00 pm

For the most part, if I am in my office, consider it an office hour. If, however, you would like to schedule a specific time outside of these hours, please talk to me after class or email me.

Lecture: M-W-F, 1:00 – 1:50 PM, 1060 Physical Science
Lab time: Thursday 1:00 – 2:40 PM, 1060 Physical Science

General course information

Required texts

Klein - *Manual of Mineral Science*, 22nd edition, by Cornelis Klein. This text covers crystallography, crystal structure, and crystal chemistry and has useful mineral identification tables.

Web sites

Publisher's site: <http://he-cda.wiley.com/WileyCDA/HigherEdTitle/productCd-0471251771.html>

Course web site for notes: May be added later

Scope of Course

Mineralogy is the study of Earth materials. As a society, we consume large amounts of minerals to perpetuate life as we know it. Furthermore, minerals have considerable significance on the quality of our environment and are used in many technological applications. The goal of this course is to give you knowledge of the types of Earth materials that exist, to enable you to link the chemical processes and composition of minerals with atomic-scale processes, and to give you insight into how matter is arranged on Earth.

Students with Disabilities (Whether learning, physical, psychiatric, or sensory)

Eastern Illinois University promotes equal educational opportunities for students with disabilities. If you have a disability and may need any assistance, please notify your instructor and make an appointment immediately with the Office of Disability Services (9th Street Hall, or Office Phone: 581-6583, Voice TTY: 581-6583, Fax: 581-7208, or <http://www.eiu.edu/~disabltty>)

Make ups, Missed, and Late Assignments:

“Make ups” are generally not allowed except in the most unusual and dire of circumstances. If a “make up” is allowed, it is best you discuss the reason with me ahead of time, not after the fact. Late lab assignments will be docked 5 points per day. Missed assignments will not be made up unless you have a valid reason (and note from a coach, doctor, etc.) and have talked to me first.

Classroom policy

You are in this class to learn, so disruptions will not be tolerated. Not only is this disruptive to me, but also to your fellow classmates. With this in mind, I ask that you arrive to the class on time and that there are no classroom conversations or other distractions. If you must talk, please take it outside, or I will ask you to do so. Pagers, beepers, or cell phones are not allowed to ring in class.

Grading

A breakdown is as follows:

Exams: There will be two exams that are worth 15% of your grade each. These will be a combination of multiple choice and short answer questions and may require you to draw or label diagrams.

Final Examination: The final examination will have the same format as the other examinations and will primarily cover material presented after Exam #2. It is also worth 15% of your total grade. The final exam will last two hours and is scheduled for Thursday, Dec. 15 12:30-2:30 pm.

Labs/Homework: Labs are fundamental to learning geology. In this course, making the link between the sometimes abstract nature of crystallography and real minerals is essential. Another essential part of this course is learning the basic skills necessary to identify unknown mineral specimens, as well as learning the attributes that characterize common rock forming minerals. Labs are due the week after they are assigned. You may also have a few homework assignments to complete; these will be assigned/discussed primarily during the laboratory section. Labs and homework combined will be worth 20% of your grade. In lab you will have two lab exams, worth 10% of your grade apiece. The first will be on crystallography and the second on mineral identification.

Mineral Recalculation Project: This will be assigned in the middle of the semester and will be due on the last day of class (December 9th). More details to follow, however, this will be worth 15% of your grade!

Assignment	Total %
Labs/Homework	20%
Lecture Exams (2 @ 15%)	30%
Final Exam	15%
Lab Exams (2 @ 10%)	20%
Mineral recalculation project	15%
Total	100%

The grading scale will be based on the following:

90% - 100% = A

80% - 89% = B

70% - 79% = C

60% - 69% = D

0 - 59% = F

Class Schedule

Assignments should be completed before class - read the chapters and review the labs.

Week	Date	Day	Topics	Reading	Lab Topic
1	8/22	Monday	Introduction; conditions of genesis	Chapter 1, 5	Crystallographic axes
	8/24	Wednesday	Mineral properties; crystal systems		
	8/26	Friday	Crystal systems; symmetry operators		
2	8/29	Monday	Crystal classes and forms	5	Symmetry
	8/31	Wednesday	Crystal classes and forms		
	9/2	Friday	Crystal classes and forms		
3	9/5	Monday	No classes – Labor Day	5, 6	Triclinic, monoclinic, & orthorhombic models
	9/7	Wednesday	Crystal classes and forms		
	9/9	Friday	Miller indices		
4	9/12	Monday	Bravais lattices, the 230 space groups	5, 6	Tetragonal models
	9/14	Wednesday	Bravais lattices, the 230 space groups		
	9/16	Friday	Bravais lattices, the 230 space groups		
5	9/19	Monday	Crystallography summary/review	6, 3	Hexagonal models
	9/21	Wednesday	Exam #1		
	9/23	Friday	Chemical bonding		
6	9/26	Monday	Chemical bonding	3, 4	Isometric models
	9/28	Wednesday	Structural defects: twinning & color		
	9/30	Friday	Polymorphism & solid solution		
7	10/3	Monday	Mineral formulas/calculations	3, 2	Lab exam #1 (Crystallography)
	10/5	Wednesday	Physical properties of minerals		
	10/7	Friday	No Classes – Fall Break		
8	10/10	Monday	Physical properties of minerals	2	Mineral recalculation project and physical properties of minerals
	10/12	Wednesday	Mineral Genesis-igneous		
	10/14	Friday	Mineral Genesis-sedimentary		
9	10/17	Monday	Mineral Genesis-metamorphic	11, 12	Mineral ID #1
	10/19	Wednesday	Silicates-intro; single tetrahedral		
	10/21	Friday	Silicates-double and ring tetrahedral		
10	10/24	Monday	Silicates- pyroxenes	11, 12	Mineral ID #2
	10/26	Wednesday	Exam #2		
	10/28	Friday	Silicates-pyroxenes		
11	10/31	Monday	Silicates-amphiboles	11, 12	Mineral ID #3
	11/2	Wednesday	Silicates-micas		
	11/4	Friday	Silicates-feldspars		
12	11/7	Monday	Silicates-feldspars & feldspathoids	11, 12, 8	Mineral ID #4
	11/9	Wednesday	Native elements, sulfides, sulfosalts		
	11/11	Friday	Native elements, sulfides, sulfosalts		
13	11/14	Monday	Oxides, hydroxides, halides	9	<i>No lab- work on note cards</i>
	11/16	Wednesday	Oxides, hydroxides, halides		
	11/18	Friday	To be announced		
14	11/21– 25		No classes – Thanksgiving Break		
15	11/28	Monday	Carbonates, sulfates, phosphates	10, 4	Mineral ID #5
	11/30	Wednesday	Carbonates, sulfates, phosphates		
	12/3	Friday	Phase diagrams		
16	12/5	Monday	Phase diagrams	4	Lab exam #2 (Mineral ID) (turn in note cards)
	12/7	Wednesday	Phase diagrams		
	12/9	Friday	Review and summary (Min. Calc due!)		
17	12/15	Thursday	Final Examination 12:30 – 2:30 PM		