

# *Mineralogy - 012:041*

## Preliminary Syllabus

**Instructor:** Dr. Mark Reagan: [mark-reagan@uiowa.edu](mailto:mark-reagan@uiowa.edu)  
Office: Dept. of Geoscience, Trowbridge Hall (TH), rm. 121  
Tele: 5-1820  
Office hours: 1-4 PM T or make an appointment through Chris Harms.

**Teaching Assistants:**  
Daniel Cukierski, Office: B24B TH, Office hrs: 11-1 M, 10-11 F  
Neo McAdams, Office: 263 TH, Office hrs: 2:30-3:30 MWF

**Class Meetings:**  
Lecture: 1:30 p.m.; MWF; Rm. 136 TH  
Labs: 2:30P - 5:20P W **or** 1:30P - 4:20P Th; Rm. 135 TH

**Required Textbook:** (at: University Bookstore)  
*Introduction to Mineralogy*; Nesse, Oxford University Press, 2011, ISBN 0199827389

**Useful texts:**  
*An Introduction to the Rock-Forming Minerals*; Deer, Howie, and Zussman, 2nd. ed.;  
Prentice Hall, 1996, ISBN 978-0-582-30094-1  
*Minerals in Thin Section*; Perkins and Henke, 2nd. ed.; Prentice Hall, 2003, ISBN  
0131420151

**Required materials:**  
Hand lens preferably: 10x triplet;  
[e.g. Illuminated 10x wide field hand lens (\$23.20, [Miners Inc.](#)); Bausch & Lomb  
10x Hastings triplet (\$36.15, [Miners Inc.](#)); BelOMO 10x Triplet Loupe Magnifier  
(\$27.25, [geo-tools.com](#)) all summer 2012 prices]

Periodic table with atomic weights, valence information, ionic radii

**WWW site:** Use the ICON web site of the University to logon to the course site.

**Wiki site:** On ICON home page for course. See: <http://wiki.uiowa.edu/display/DOC/Home> for  
information about using Wiki sites

### **Details**

This course teaches you to recognize and understand the origin and significance of minerals, which are the building blocks of nearly all inorganic materials. A thorough knowledge of the information presented in this class is critical for doing well in many classes in the Geoscience and Environmental Science majors as well as for any employment in the geosciences.

One goal of the course is to teach you to identify approximately 100 of the most common or important minerals using a few simple field tests, a hand-lens, and a petrographic microscope. Other course goals are to teach you crystal structures, optical properties, chemical compositions and occurrences of these minerals. A list of minerals and properties will be handed out early in the course as a guide for the course, including the quasi-daily quizzes (see below).

The information for this course will be taught in lab and lecture formats. The lectures will teach the basic physical and chemical concepts behind of crystallography, chemical bonding, optics, mineral occurrences, ways to distinguish one mineral from another, classifying minerals, and knowing their structure and chemical compositions. The laboratories will focus on recognition of minerals in hand-specimen and thin-section. **It is essential that you study and learn the material as it is covered - do not fall behind.**

The lecture is taught in a TILE classroom (see: <http://its.uiowa.edu/instruction/tile/strategies.shtml>), which will involve periodic group activities. Groups will be chosen by me and probably will be reshuffled every few weeks. The activities typically will be hands-on exercises that will help foster learning of the subject matter.

During the first, more theoretical portion of the course, and for each class period, every class member will read the assigned reading and add a well-thought-out question based on this reading to the Wiki page by 8:00 AM of the day of the class. There will be a quiz each day utilizing one of these questions. Several of the best questions will be kept on the home Wiki page, and some of the questions will be used on the midterm. After the quiz, we will discuss concepts that need the most clarification.

For the mineral portion of the course, each group of students will use various resources to create a presentation for the class with important information about a mineral (properties, occurrences, etc.) from the "rock of the day". I will add edited class presentations to the ICON page. Each student in the class should be prepared with a question or comment about each mineral. For this portion of the course, the beginning quiz will require each student to know the formulae, crystal systems, and occurrences of several minerals covered in the prior classes. There also will be some take-home exercises, a lecture midterm, and a comprehensive lecture final exam. The laboratory portion of the course also will have a final, as well as a mineral test that will use the same format as the final. Expect to spend extra time in the lab each week (subject to use of the room by other classes - so see Chris in 121TH if you need the room after hours).

The final grades will be calculated this way:

- Lecture quizzes & exercises, class & group participation (25% - note: lecture attendance will be taken and counts towards the participation grade; the lowest two quiz or exercise grades will be dropped)
- Lecture midterm (15%)
- Laboratory mineral test (5%)
- Lecture and Laboratory finals (total: 30%)
- Lab exercises & lab quizzes (25%)

Grade distributions are typically similar to the CLAS recommended grade distributions for introductory classes (see CLAS web site). However, grade distributions for classes with an overall performance above or below the time-averaged norm for the class will be adjusted accordingly. I use plus/minus grading.

Due dates for assignments are absolute; late work will be corrected and returned, but you get a "zero" unless you have a documented excuse. This draconian measure is taken to assure that you do not fall behind in the class. **Note: poor attendance will severely affect your grade.**

Note, I reserve the right to change the course structure, schedule, and syllabus as needed.

### Tentative Schedule

<u>August</u>	<u>Topic</u>	<u>Chapter</u>	<u>Lab</u>
20-24	Intro and crystallography	1-2	Take home exercise
27-31	Chemistry review and crystal chemistry	3	Crystallography
<b><u>September</u></b>			
3-7	Crystal symmetry, structure, and growth	4-5	Crystal chemistry
10-14	Physical properties, optical mineralogy	6-7	Physical properties
17-21	Optical mineralogy cont.	7	Optical min. I
24-28	Mineral analysis and ID	8-10	Optical min. II
<b><u>October</u></b>			
1-5	Mineral environments, silicate structure	11	Basic petrography
8-12	Mineral groups, <b>Lecture Midterm</b>	12-20	Crystal structures and mineral groups
<b><i>Rocks of the Day</i></b>			
15	Basalt - Gabbro	12-20	
17	Andesite - Granodiorite	12-20	Igneous minerals I
19	Rhyolite - Granite	12-20	
22	Basanite - Syenite	12-20	
24	Phonolite & Carbonatite	12-20	Igneous minerals II
26	Peridotite	12-20	
29	Greenschist & amphibolite	12-20	
31	Blueschist & eclogite & granulite	12-20	Metamorphic mins.
<b><u>November</u></b>			
2	Pelitic schist & gneiss	12-20	
5	Sandstones	12-20	
7	Limestones	12-20	Sedimentary mins. & mineral test
9	Evaporites	12-20	
12	Soil	12-20	
14	Zeolites	12-20	Environmental mins.
16	Copper porphyry	12-20	
19-23	(Thanksgiving)		
26	Pb-Zn-Ag massive sulfide	12-20	
28	Magmatic sulfide	12-20	Hydrothermal mins.
30	Shallow hydrothermal veins (Au)	12-20	
<b><u>December</u></b>			
3	Chondrites - Fe-meteorites	12-20	
5	UHP - deep mantle	12-20	Ore mins. & meteorites
7	Review		
<b>Final exams – two, one-hour tests, time TBA</b>			

## **Department of Geoscience Syllabus Information:**

**Department Office:** 121 Trowbridge Hall

Telephone: 319-335-1818

**Department Chair (DEO):** Prof. M.K. Reagan

DEO Office: 121C TH

DEO Telephone: 319-335-1820

DEO Email: [geology-deo@uiowa.edu](mailto:geology-deo@uiowa.edu)

### **Administrative Home**

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at <http://clas.uiowa.edu/students/handbook>.

### **Electronic Communication**

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences. (*Operations Manual*, [III.15.2](#), k.11.)

### **Accommodations for Disabilities**

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See [www.uiowa.edu/~sds/](http://www.uiowa.edu/~sds/) for more information.

### **Academic Honesty**

All CLAS students have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled ([CLAS Academic Policies Handbook](#)).

### **CLAS Final Examination Policies**

The final examination schedule for each class is announced around the fifth week of the semester by the Registrar. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the dates and times of each final exam, the complete schedule will be published on the Registrar's web site.

### **Making a Suggestion or a Complaint**

Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident ([CLAS Student Academic Handbook](#).)

### **Understanding Sexual Harassment**

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI [Comprehensive Guide on Sexual Harassment](#) for assistance, definitions, and the full University policy.

### **Reacting Safely to Severe Weather**

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Public Safety [web site](#).

### **Rights and responsibilities in the classroom**

The College's statement on student rights and responsibilities can be found at:

<http://www.clas.uiowa.edu/students/handbook/x/>.