Mineralogy

Professor: Kurt C. Friehauf Tel.: 610-683-4446
Office: Boehm Bldg. #135 Email: friehauf@kutztown.edu
Office hours: MWF9-10, MF1-2 www: http://faculty.kutztown.edu/friehauf

Course Objectives: Mineralogy, petrology, and geochemistry form a tightly interwoven basis for understanding many of the processes that govern the distribution of natural materials. The concepts you'll learn in this course are directly relevant to your future studies in all facets of geology, whether you're interested in mining, petroleum, water resources, environmental sciences, paleontology, archeology, materials science, etc.

This course is designed to help you develop four broad skills: 1) an understanding of the basic concepts of mineralogy and crystal chemistry, 2) an ability to recognize minerals in hand specimen and apply that knowledge toward deducing physiochemical conditions and processes in nature, 3) a sharply-honed ability to communicate both in writing and speech, and 4) a philosophy of professionalism that will set you apart both in school and in the job market.

Course requirements: Because mineralogy is a bridge for understanding how chemistry/physics apply to much of the environment around us, the prerequisites for this class include both GEL100 and a facility with basic chemistry. I know that several of you are taking CHEM100 concurrently with this class this semester, and I suspect that some of you who've already taken chemistry may not feel *completely* comfortable with your knowledge of chemistry. With that in mind, we will start from the ground and work our way up. I will also be trying to parallel some of the topics in Mineralogy with topics being taught at the same time in CHEM100 with the purpose of reinforcing your learning of chemistry by giving you a geological context.

Textbook and studying: The textbook *Earth Materials* by Kevin Hefferan and John O'Brien. It's a very easy read for its genre with fascinating little side notes, and a good reference that you'll return to during your professional career.

Lecture notes should be the basis for much of your study.

Research in the field of cognitive psychology demonstrates that people learn things best if they think about the newly-learned material on their own shortly after their first exposure. I encourage you to talk about what we learn in lecture with your friends in this class, to look over your notes for the day for 10-15 minutes in the evening after lecture, and scan relevant sections of the textbook. Your textbook is an excellent supplement to lecture because it covers many topics in greater depth and

with nicer illustrations than you and I can sketch in lecture. A little time devoted to this each evening will help reduce the stress of cramming for exams.

I very, *very,* ***very*** strongly suggest that you pair up with a partner or two and *schedule* one or two one-hour blocks of time each when you can get together to study the minerals in the mineral collection. Slow and steady wins this race.

Scientific literature / supplementary reading: Because keeping up with the scientific literature is such an integral part of being a professional scientist, I want to get you into the practice of reading early in your careers. Learning to read scientific papers now will help you in your other science classes and in your careers beyond Kutztown. We'll start with some popular science articles to get warmed up, but will ultimately read a paper or two from the professional scientific journals. We will walk through the first paper together so you can learn effective reading strategies. This exercise is intended to help you develop a critical mind when reading the literature, which will be one of the most important skills you'll learn in your undergraduate career.

Attendance/late policy: Lecture attendance is *strongly* recommended and lab attendance is **required**. Students who miss lectures and/or labs will be at a serious disadvantage. Make-up exams will be given only by prior arrangement or in the case of genuine emergencies. Lab quizzes cannot be made up (we'll drop the *single* lowest score). Labs and homework assignments will be accepted late *only* by prior arrangement or special announcement. **Fieldtrip participation is absolutely mandatory.**

Honor code: Strict accordance with the University policies concerning plagiarism, cheating, etc. is expected. You are ***geologists*** – i.e., you are ***professional scientists***. Start living as a professional now. **Think Bushidō.** This does not preclude discussing homework, lab assignments, and research projects with each other – sometimes you must work together in teams; however, you are responsible for your own answers – after all, this is *your* education, *your* honor, and *your* reputation!

Hand lens: As a geologist and a naturalist, you will need a hand lens (pocket magnifier) for examination of minerals and rocks. You are required to buy one. The cost $10 to $30 depending on the quality and magnification (10x or 15x is appropriate). We can purchase hand lenses in bulk to get a better price on good quality lenses if you like.

You will need your hand lens in every lab exercise, in several lectures, and for lab exams. **BE VERY CAREFUL TO *ALWAYS* BRING YOUR HAND LENS TO LAB – YOU MAY NOT PARTICIPATE WITHOUT IT.** Hardness probes and swivel magnets are ***required*** supplemental tools.

Fieldtrips: We will have two field trips in this course. Field trips are important in this class for several reasons: 1) it is important for the learning process to apply what you learn to real-life situations, and 2) sharing field experiences with your classmates will help you develop as friends and professional colleagues. All fieldtrips will take place on weekends because of the travel times required so please make appropriate preparations. The Adirondack fieldtrip takes five days.

Class website: Important announcements made in class will also be posted on the class website to avoid confusion and miscommunication. The URL for our class website is **http://faculty.kutztown.edu/friehauf/classes/mineralogy**

Grading/Feedback: I need to be able to evaluate how well you've learned the material in this course. Because geology is such a "hands-on" science, your lab work and homework will be important. Because every one of us develops through life a different way of seeing things (our *Weltanschauung*), the purpose of the homework and labs is to help you build a *personal* understanding of the facts. Homework problems will require the use of a computer (spreadsheets, word processing, and graphics) and will give you the opportunity to practice your communication skills.

There will be three exams in the course. The exams will allow you the opportunity to apply your knowledge on your own and will combine calculations, knowledge, and practical skills.

	number	points each	total points
Quizzes	6	100,000,000	600,000,000
Labs	10	100,000,000	1,000,000,000
Homework		550,000,000	550,000,000
Adirondack fieldtrip	1	300,000,000	300,000,000
Term presentation	1	300,000,000	300,000,000
Exams	3	600,000,000	1,800,000,000
Total			4.55 billion

As geologists, there are certain basic competencies you will need to have. The ability to identify the most common minerals (the GEL100 set) is one such competency. To assess this basic competency, you will have three (3) chances to pass the **B**asic **M**ineral **C**ompetency **E**xam. A score of **85% or better constitutes a passing score**. Failure to pass the Basic Mineral Competency Exam will result in a course grade of "F" regardless of your performance on all other work in the class.

Because this course is an opportunity for you to develop ***your own*** understanding of geology, rather than an intellectual competition between you and your peers, there will be no curving of grades. Your letter grade in this class is independent of the performance of your peers. This means that it is possible for *everyone* in the class to achieve A's, so it is to your benefit to study ardently and do your own work, *but also to help each other out*.

Finally, to earn a course grade of "A," you must complete ***all*** work. All other grades may be achieved without this special requirement.

Your final course grade will be determined based on your performance in ALL THREE CRITERIA:

1. Passage of the Basic Mineral Competency Exam
2. Course work average
3. Whether or not you complete all assignments

<table>
<tr><th>1. Basics exam</th><th>2. Course work</th><th>3. Assignment completion</th><th>4. Course grade</th></tr>
<tr><td rowspan="5">pass Basic Mineral Competency Exam</td><td rowspan="2">90-100%</td><td>all work completed</td><td>A</td></tr>
<tr><td>one or more assignments not completed</td><td rowspan="2">B</td></tr>
<tr><td colspan="2">80-89%</td></tr>
<tr><td colspan="2">70-79%</td><td>C</td></tr>
<tr><td colspan="2">60-69%</td><td>D</td></tr>
<tr><td colspan="2"><60%</td><td rowspan="2">F</td></tr>
<tr><td colspan="3"><u>not</u> pass
Basic Mineral Competency Exam</td></tr>
</table>

Special Needs: If you have already disclosed a disability to the Disability Services Office (215 Stratton Administration Building) and are seeking accommodations, please feel free to speak with me privately so that I may assist you. If you have an injury sustained during military service including PTSD or TBI, you are also eligible for accommodations under the ADA and should contact the Disability Services Office