GEOL 110
EARTH MATERIALS
Spring, 2013

Professor John M. Hughes
321 Delehanty Hall; 6-9443
jmhughes@uvm.edu
Office hours: MWF 1:00-2:00
or by appointment

Teaching Assistant:
Jacob Menken
Jacob.menken@uvm.edu
Office Hours: TBA

Tentative Lecture Schedule:

1/15: Introduction; Conditions of Mineral Genesis; Crystal Systems
1/17: Symmetry Operators; Symmetry Operators
1/22: Crystal Classes and Forms
1/24: Crystal Classes and Forms
1/29: Law of Rational Indeces; Weiss Parameters and Miller Indeces
1/31: Bravais Lattices; Space Groups and Special Symmetry
2/5: Bonding; Pauling’s Rules, Coordination Polyhedra
2/7: Bonding cont'd
2/12: Crystallographic Calculations, Isomorphs and Polymorphs
2/14: **H O U R E X A M # 1**
2/19: Isomorphs and Polymorphs, Phase Transitions, Solid Solutions
2/21: Mineral Genesis
2/26: Mineral Genesis
2/28: Mineral Genesis

---Spring Break---

3/12: Silicates
3/14: Silicates
3/19: Silicates
3/21: Silicates
3/26: Silicates
3/28: Native Elements, Sulfides, Sulfosalts
4/2: Oxides, Hydroxides, Halides
4/4: **H O U R E X A M # 2**
4/9: Carbonates, etc.
4/11: Phase Diagrams
4/16: Phase Diagrams
4/18: Phase Diagrams
4/23: Minerals in Rocks
4/25: Minerals in Rocks
4/30: Minerals in Rocks
A final exam is scheduled for Friday, May 3, 2013, 10:30 - 01:15 PM in 219 Delehanty.

Course Goals:

Mineralogy is the study of Earth materials. As a society, we consume large amounts of minerals to perpetuate life as we know it. The goals of this course are:

1. to give you knowledge of the types of Earth materials that exist,
2. to enable you to link the chemical processes and composition of minerals with atomic-scale processes, and
3. afford insight into how matter is arranged on Earth.

Evaluation:

You will be evaluated in the course based on the following weights: 25% each for two exams, Final Exam, and Laboratory. If at any time you want to discuss your progress in the course or have any concerns, please don't hesitate to see me. The test dates are considered tentative until I get your input. We may adjust the dates one or two days either way on January 24. After that date they will not be changed except with much notice.

Laboratory:

Weekly laboratory sessions are scheduled for Tuesday and Thursday afternoons, 2:30 - 5:15, in Room 218 (you should have enrolled for one of these sessions). Your laboratory grade will be based on laboratory exercises that will be handed in and a Mineral Identification Quiz.

Textbook:

Mineralogy and Optical Mineralogy, Dyar, Gunter, and Tasa. Available at the Mineralogical Society of America (https://msa.minsocam.org/publications.html under textbooks) - Note you get 25% off if you join MSA, which costs $10.

Handlens:

You will each be required to obtain a 10x hand lens (with lanyard) for field and laboratory work – they are available from Kooters Geology supply (http://www.kooters.com/handlens.html) for a good price, also available other places if you wish. I recommend either the value 10x triplet magnifier (they are $16 dollars and it has a larger lens than others) or the Bausch&Lomb 10x Hastings triplet (more expensive but higher end). I also recommend you each get a rock hammer and a good field hat, items you would be OK without for this class in general, but key pieces of gear for field work!
Attendance Policy:

As with all courses at the University of Vermont, you are expected to attend every class. A formal attendance policy will be erected with the aid of the class.

Academic Integrity:

The University of Vermont maintains a Code of Academic Integrity, which can be viewed at: http://www.uvm.edu/policies/student/acadintegrity.pdf. As a student at the University, you are required to adhere to the policy. If you are not familiar with the policy, you should access it at the above site and review its contents.

Religious Holidays:

As quoted from UVM Policy, Students have the right to practice the religion of their choice. Each semester students should submit in writing to their instructors by the end of the second full week of classes their documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observance to make up this work. To access the policy, please visit: http://www.uvm.edu/academics/catalogue2006-07/?Page=allpolicies.php&SM=policymenu.html&category=academic_policies&policy=Rights%20and%20Responsibilities%20of%20Undergraduate%20Students.

Tentative Laboratory Schedule:

Week of:
1/17: NO LABORATORY
1/24: Model symmetry
1/31: Model Symmetry
2/7: Model Symmetry
2/14: Mineral Identification in Hand Specimen
2/21: Mineral Identification in Hand Specimen
2/28: Mineral Identification in Hand Specimen
3/13: Mineral Identification Quiz
3/20: Optical Mineralogy
3/27: Optical Mineralogy
4/3: Optical Mineralogy
4/10: Minerals in Rocks
4/17: Minerals in Rocks
4/24: Minerals in Rocks