

GEOL 231 Petrology Fall 2018 Syllabus

Lectures: Tuesdays & Thursdays 2:50–4:05 in Delehanty 219

Labs: Wednesdays 9:40–12:50 in Delehanty 218

4 credits

Instructor: Laura Webb

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Office hours: By appointment (preferred) or drop in.

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Readings: The textbook for this course is *Essentials of Igneous and Metamorphic Petrology* by B. R. Frost and C. D. Frost (first edition, published in 2014 by Cambridge University Press). Supplemental readings will be posted on Blackboard or handed out in class.

Course description: The course is an introduction to the scope and methods of igneous, sedimentary and metamorphic petrology with a focus on igneous and metamorphic rocks. We will cover the classification, compositions, textures, tectonic environments, and processes relevant to the major rock types. In this course you will investigate a variety of clues that rocks preserve, such as textures observed in thin section, that reveal information regarding the conditions of their origin and evolution. We will also investigate the application of petrology to broader issues such as medical geology, non-renewable natural resources and climate change.

Learning objectives: After successfully completing this course, you will be able to:

- 1) Characterize major rock types based on mineral assemblages and textures.
- 2) Use your observations regarding assemblages and textures to infer possible petrologic reactions and/or constrain petrologic variables such as pressure, temperature and composition.
- 3) Interpret petrologic observations and formulate hypotheses regarding geologic environments and tectonic histories.
- 4) Apply principles of petrology to broader themes such as medical geology, non-renewable resources and climate change.

Grading: Your grade in this course will be based on lab exercises (45%), exams (25%), homework (20%), and participation in class, lab, and fieldtrips (10%). **Assignments are due at the start of the class meeting period indicated. Late assignments will have grades reduced by one letter grade per day beginning on the due date.**

Codes of conduct: Codes of conduct outline student rights, policies, and the procedures the University will follow if a student is allegedly involved in a policy violation:

Code of Student Rights and Responsibilities:

<http://www.uvm.edu/~uvmppg/ppg/student/studentcode.pdf>

Code of Academic Integrity:

<http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf>

Religious Holidays: 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.

Student Accessibility Services (SAS): In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of disability services on campus. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated in an accommodation letter to faculty. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. Contact SAS: A170 Living/Learning Center; 802-656-7753; access@uvm.edu; or www.uvm.edu/access.

PETROLOGY SCHEDULE

Please note: The schedule below may be subject to revision

Day	Date	Topic	Reading
Tu	8/28/18	Intro and overview	GEOL110 RoCKs Docs
W	8/29/18	<i>No lab</i>	
Th	8/30/18	Classification of igneous rocks	Chapter 1
Tu	9/4/18	Thermodynamics and phase diagrams	Chapter 2
W	9/5/18	Lab: Igneous minerals (review) and textures	
Th	9/6/18	Magmatic systems and phase diagrams	Chapters 3 and 4
Tu	9/11/18	Petrology of the mantle and oceanic crust	Chapters 5 and 6
W	9/12/18	Lab: Oceanic lithosphere	
Th	9/13/18	Convergent margin magmatism	Chapter 7
Tu	9/18/18	Intracontinental magmatism	Chapters 8 and 9
W	9/19/18	Lab: Stillwater complex	
Th	9/20/18	Interpretation of granitic rocks	Chapter 10
Tu	9/25/18	Plutons and batholiths: discussion of readings	
W	9/26/18	Lab: Boulder batholith	
Th	9/27/18	Summary of igneous rocks and tectonic environments	
Tu	10/2/18	Intro to sedimentary rocks and environments	Readings TBA
W	10/3/18	Midterm and lab practical: igneous rocks	
Th	10/4/18	Clastic sedimentary rocks I	Readings TBA
Tu	10/9/18	Clastic sedimentary rocks II	
W	10/10/18	No lab; lecture carbonate sedimentary rocks	
Th	10/11/18	Introduction to metamorphic rocks	Chapter 11
Tu	10/16/18	Assemblages, reactions, and equilibrium	
W	10/17/18	Lab: Sedimentary rocks	
Th	10/18/18	Introduction to chemographic projections	Chapter 12
Tu	10/23/18	Metamorphic textures	
W	10/24/18	Lab: Metamorphic textures	
Th	10/25/18	Metamorphism of mafic rocks	Chapter 13
Sa	10/27/18	Petrology field trip (all day)	
Tu	10/30/18	Thermobarometry and P-T-t-D paths	Chapter 14
W	10/31/18	Lab: Metamorphism of mafic rocks	
Th	11/1/18	Metamorphism of pelitic rocks	Chapter 16
Tu	11/6/18	Metamorphism of ultramafic and calcareous rocks	Chapters 15 and 17
W	11/7/18	Lab: Metapelites	
Th	11/8/18	Petrology and tectonics research	
Tu	11/13/18	Petrologic environments for ore formation	Readings TBA
W	11/14/18	Midterm and lab practical: sedimentary and metamorphic rocks	
Th	11/15/18	Petrology and climate	
Tu	11/20/18	<i>Thanksgiving Recess</i>	Readings TBA
W	11/21/18	<i>Thanksgiving Recess</i>	
Th	11/22/18	<i>Thanksgiving Recess</i>	
Tu	11/27/18	Petrology of talc deposits	Readings TBA
W	11/28/18	Medical geology focus on talc and asbestos—Petrology matters!	
Th	11/29/18	<i>LEW at John Hopkins University (no lecture)</i>	
Tu	12/4/18	Medical geology focus on talc and asbestos	
W	12/5/18	Medical geology focus on talc and asbestos	
Th	12/6/18	Summary and wrap-up	