

## GEOL 443 SYLLABUS

Igneous and Metamorphic Petrology, Spring 2013  
Tuesday & Thursday  
8:00 a.m. – 9:15 a.m., PLS 1113

Date	Subject	Reading
Jan 24	Introduction: Overview of petrology, rocks. Structure and dynamics of the Earth. Where are igneous rocks generated?	Chapter 1
Jan 29	Classification and nomenclature	Chapters 2, 8
Jan 31	Topics of 1/29, continued	Chapter 2, 8
Feb 5	Textures	Chapter 3
Feb 7	Structures and field relations (read); Intro to Thermodynamics	Chapters 4, 5
Feb 12	Phase rule, unary and binary systems	Chapter 6
Feb 14	Topics of 2/12 continued	
Feb 19	Ternary Systems	Chapter 7
Feb 21	Ternary Systems, continued	
Feb 26	Mantle melting & generation of basalts	Chapter 10
Feb 28	Diversification of magmas	Chapter 11
March 5	Igneous Rock Associations (subduction zones and granitoids)	Chapters 12-18
March 7	<b>Exam 1</b>	Chapters 12-18
March 12	Review exam, Topics of 3/6 continued	Chapters 12-18
March 14	Introduction to metamorphism, types of metamorphism	Chapter 21, 22

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Date	Subject	Reading
March 18-24	<b>Spring Break!</b>	
March 26	Introduction continued, Types of metamorphism	Chapter 21, 22
March 28	Chemographics and metamorphic phase diagrams	Chapter 24
April 2	Pelitic Rocks: Barrow's zones, AFM projections, discontinuous and continuous reactions	Chapters 26 & 28
April 4	Pelitic Rocks: continued	Chapters 26 & 28
April 9	Types of metamorphic reactions	Chapter 26
April 11	Metamorphism of mafic rocks	Chapter 25
April 16	Metamorphism of Ultramafic rocks	Chapter 29
April 18	Metamorphism of Calcareous rocks	Chapter 29
April 23	P-T paths and orogeny	Chapters 25, 27
April 25	<b>Exam 2</b>	
April 29	Extremes: UHP and UHT metamorphism	Chapter 25
May 1	Thermodynamics of metamorphic reactions	Chapter 27
May 7	Thermobarometry	Chapter 27
May 9	Metamorphic Fluids, mass transport and metasomatism	Chapter 30

**Final Exam: May 16 (Thursday), 10:30-12:30 p.m.**

**Required Class Field Trip: Saturday, April 20**

## **Labs (GEOL 2117)**

Jan. 24	Review of Microscopy, Petrography of rocks, textures and mineral review
Jan. 31	Granites and related rocks
Feb. 7	Rhyolites, tuffs, scoria, pumice and obsidian
Feb. 14	Intermediate volcanic rocks
Feb. 21	Intermediate plutonic rocks
Feb. 28	Mafic volcanic and plutonic rocks
Mar. 7	Ultramafic rocks and alkaline rocks
Mar. 14	Metamorphic minerals and textures ( <b>read Chapter 23 in advance</b> )
Mar. 21	<b>SPRING BREAK</b>
March 28	Structures and textures of metamorphic rocks ( <b>read Chapter 23, esp. 23.1, 23.4.1 and 23.4.5 in advance</b> )
April 4	Progressive metamorphism of metapelites
April 11	Metamafic rocks, metamorphic facies and disequilibrium textures
April 18	Metamorphosed calcareous and ultramafic rocks
April 25	Minerals and textures of HP and UHP rocks
May 1	Review. Preparation for laboratory practical
<b>May 9</b>	<b>IGNEOUS and METAMORPHIC LAB PRACTICAL</b>

## **Instructors**

- Sarah Penniston-Dorland, contact: 5-6239, [sarahpd@umd.edu](mailto:sarahpd@umd.edu), Office 1221B Chemistry, office hours: Tuesdays 1:00-2:00 pm (or arrange via email or phone).
- Richard Walker, contact: 5-4089, [rjwalker@umd.edu](mailto:rjwalker@umd.edu), Office 0228 Chemistry, office hours: Tuesday 9:30-10:30 (or arrange via email or phone).
- Kristy Long (for the laboratories), contact: [long@umd.edu](mailto:long@umd.edu), Office 0226 CHEM, office hours: by appointment.

## **Text**

*Principles of Igneous and Metamorphic Petrology*, Second Edition, J.D. Winter, ISBN: 13: 978-0-321-59257-6 and 10: 0-321-59257-3

## **Course Description**

This course provides an introduction to the petrology of igneous and metamorphic rocks. Topics include generation of igneous and metamorphic rocks in various plate tectonic settings, introduction to thermodynamics, phase diagrams, thermobarometry, textures and occurrence of igneous and metamorphic rocks.

Prerequisite: Mineralogy (GEOL 322)

Prerequisite: Optical Mineralogy (GEOL 423)

## **Attendance**

Attendance at lectures is strongly encouraged. If you know in advance that you cannot make a lecture, let us know and we will make arrangements for you to obtain the material covered.

## **Structure and Grading**

The course will consist of two 1 1/4 hour lectures per week, Tuesdays and Thursdays at 8 a.m. in room 1113 of the Plant Sciences building. Grading will be assessed on the basis of homework, quizzes, classroom and fieldtrip participation (10%), laboratory (25%) [50% of the laboratory grade will be based on lab assignments and 50% will be based on the laboratory practical], two one and 1/4 hour exams (20% each), and a comprehensive final exam (25%).

Laboratory assignments are due within one week of the lab (e.g., by the beginning of the next lab). If not handed in by that time they will not be considered.

Classroom participation and punctuality will be encouraged by quizzes administered at the beginning of classes, which will count towards the participation grade.

## **Miscellaneous**

- Please purchase a hand lens (from the bookstore or other vendor) for laboratory and fieldtrip use!
- A class web page will be available on the ELMS site. Go to <https://elms.umd.edu/webapps/portal/frameset.jsp> and log in using your university username and password.
- All Powerpoint presentations as well as some course notes will be available on the web. They are **not** a substitute for class attendance and do not necessarily represent all information that is provided by class lectures. All laboratories will also be posted on this web site. You are

encouraged to download these *before* the laboratory and read them through to familiarize yourself with the topic to be covered. Note that some laboratories have assigned reading that is to be done *before* the laboratory. All assigned chapters should be read *before* the associated lecture in order to prepare yourself for the quizzes.

### **Mandatory Reminders**

- Academic Accommodations: If you have a documented disability, you should contact Disability Support Services 0126 Shoemaker Hall. Each semester students with documented disabilities should apply to DSS for accommodation request forms which you can provide to your professors as proof of your eligibility for accommodations. The rules for eligibility and the types of accommodations a student may request can be reviewed on the DSS web site at [http://www.counseling.umd.edu/DSS/receiving\\_serv.html](http://www.counseling.umd.edu/DSS/receiving_serv.html).
- Religious Observances: The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs, students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance. Notice should be provided as soon as possible but no later than the end of the schedule adjustment period. Faculty should further remind students that prior notification is especially important in connection with final exams, since failure to reschedule a final exam before the conclusion of the final examination period may result in loss of credits during the semester. The problem is especially likely to arise when final exams are scheduled on Saturdays.
- Academic integrity: The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/whatis.html>

The University of Maryland is one of a small number of universities with a student-administered Honors Code and an Honors Pledge, available on the web at <http://www.jpo.umd.edu/aca/honorpledge.html>. The code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures. The University Senate encourages instructors to ask students to write the following signed statement on each examination or assignment: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment)."

### **CourseEvalUM Spring 2013**

Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. CourseEvalUM will open for Spring 2013 on Tuesday April 23rd and close on Friday May 10. An opening announcement will be sent to faculty and instructors and then to students at their official University email accounts to open the system each term. Students will receive reminders periodically throughout the evaluation period for courses in which they have not yet completed an evaluation.

Please go directly to the website ([www.courseevalum.umd.edu](http://www.courseevalum.umd.edu)) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online, at Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.