

GEOS 3010: Minerals and Rocks Spring 2009

Syllabus

Course Information:

Lecture: TR 9:30-10:45 am, Rood Hall 1120

Instructor: Dr. Heather Petcovic, heather.petcovic@wmich.edu, 269-387-5488

Office Hours: TR 10:45-11:30, or by appointment (Rood 1137)

Lab: W 1:00-2:50 pm, or R 2:00-3:50 pm, Rood 1117

Lab Instructor: Travis Hayden, travis.g.hayden@wmich.edu, 269-615-2028

Office Hours: Wednesday 2:50-4pm, Thursday 1:00 – 2:00pm, or by appointment (Rood 1117)

Course webpage: <http://homepages.wmich.edu/~hpetcovic/GEOS3010.html>

Course information, lecture notes, homework assignments, and lab assignments will be posted on the course website. Please check for updates several times per week.

Required Texts & Materials:

(1) A Minerals and Rocks custom publication (M&RCP) in PDF format. We will distribute a CD copy of this textbook.

(2) Simon and Schuster's Guide to Rocks and Minerals (R&M): Prinz, Harlow, and Peters, 1978

(3) You will need a hand lens for the lab. A triplet style, 10x lens is recommended. Lenses will be made available for the laboratory.

Recommended CD: Hands on Mineral Identification: M. Darby Dyar, 1999

Course Description:

A one semester course covering hand specimen mineralogy and petrology; includes introduction to crystallography, physical and chemical properties of minerals, and rock description and genesis. Will not count toward a major in Geology. Prerequisites & Corequisites: Prerequisites: GEOS 1000 or 1300 and 1310, a course in college-level chemistry, or consent of instructor.

Course Objectives:

Upon completion of this course, students will be able to:

- Classify, describe, and identify the materials of which the earth is made (minerals, rocks, gems, ores, industrial minerals and rocks, and soil)
- Describe and explain the scale and nature of their origin and occurrence within the paradigm of plate tectonic theory
- Describe and explain their distribution in the outer layers of the earth including important, non-renewable energy and mineral resources
- Think critically and solve quantitative problems about the nature, occurrence, and use of earth materials

Course Schedule:

<u>READING ASSIGNMENT</u>	<u>SUBJECT</u> (lecture notes posted on course website)	<u>DATE</u>
M&RCP: <i>Introduction</i> , and Ch. 1 <i>A Plate Tectonic Primer</i>	Introduction to Minerals and Rocks; A Plate Tectonic Primer	Week 1/5
M&RCP: Ch. 2 <i>The Wilson Cycle and a Tectonic Rock Cycle</i>	A Plate Tectonic Primer; The Wilson Cycle and a Tectonic Rock Cycle	Weeks 1/12 and 1/19
	Exam #1	Tues 1/27
M&RCP: Ch. 3 <i>Introduction to Mineralogy and Crystallography</i> , and Ch. 4 <i>Crystal Chemistry</i> R&M: pp. 8-27	Elements, Minerals, Crystals, and Rocks; Basic Atomic Theory: the Periodic Table	Weeks 1/26 and 2/2
M&RCP: Ch. 5 <i>Mineral Chemistry</i> R&M: pp. 27-31, and 51-55	Mineral/Crystal Chemistry and Classification of Minerals Revisited	Week 2/2
M&RCP: Ch. 6 <i>The Unit Cell</i>	The Unit Cell; The Rock Forming Silicate Minerals: Basic Principles	Week 2/9
M&RCP: Ch. 7 <i>The Rock Forming Silicate Minerals</i> R&M: pp. 55-60	A Tour of the Rock Forming Silicate Minerals	Week 2/16
	Exam #2	Tues 2/24
	Introduction to Rocks	Thurs 2/26
	SPRING BREAK	2/27-3/6
M&RCP: Ch. 8 <i>Structure of the Earth and Origins of Magmas</i> ; and Ch. 9 <i>Magmas, Igneous Rocks, Volcanoes, and Plutons</i> ; R&M: pp. 414-19 and 427-35	The Formation of Igneous Rocks; Intrusive and Extrusive Igneous Rock Structures; Igneous Rocks and Plate Tectonics	Weeks 3/9 and 3/16
M&RCP: Ch. 10 <i>An Introduction To Sedimentary Rocks</i> Ch. 11 <i>Sedimentary Petrology: The Clastics</i> , and Ch. 11a <i>Sedimentary Petrology: Carbonates and Others</i>	Sedimentary Rocks and the Production of Sediment; Clay Minerals and Soil; Sedimentary Rocks and the Origin of Sedimentary Strata	Weeks 3/23 and 3/30
	Exam #3	Thurs 4/2
M&RCP: Ch. 12 <i>Metamorphic Rocks</i> R&M: pp. 419-21	Metamorphism and Metamorphic Rocks Metamorphic Facies and Mineral Assemblages	Weeks 4/6 and 4/13
	Economic Uses of Minerals & Rocks	Week 4/13
	Final Exam	Tues 4/21 8-10 am

Homework Assignments:

Assignments posted on course website

<u>ASSIGNMENT</u>	<u>DUE DATE</u>
Chemistry Review/Take Home Exercise #1	Tues 2/3
Take Home Exercise #2	Tues 2/10
Take Home Exercise #3	Tues 2/17
Take Home Exercise #4	Tues 2/24
Take Home Exercise #5	Thurs 3/19
Take Home Exercise #6	Thurs 4/2
Take Home Exercise #7	Thurs 4/16

Grading:

3 exams (each 10%)	30%		A	94-100%
Final exam	20%		BA	88-93%
7 homework assignments	10%		B	82-87%
In-class collaborative exercises	10%		CB	76-81%
10 labs	20%		C	70-75%
Lab exams (2 exams)	10%		DC	65-69%
			D	60-64%
			E	<60%

Late Work/Make-up Policy:

There will be no make-up for missed in-class collaborative assignments – please do not ask. Generally, the only excusable absences will be due to health, serious family emergencies, or religious observances. It is your responsibility to inform the instructor in advance if an absence is required. In the event that you miss class or lab, it is your responsibility to get notes, assignments and handouts from your instructor.

Late work will not be accepted beyond one class session after the due date. A 20% penalty will be assessed against the maximum possible points for any late assignment. Assignments are due on the date specified regardless of whether or not you are in class. If you miss class on the day an assignment is due, email the assignment to your instructor to avoid the late penalty.

Students with Special Needs:

Students who require special accommodations in this course are asked to inform both the course and lab instructors as soon as possible, who will make every effort to meet your requests.

Academic Honesty:

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate Catalog that pertain to Academic Honesty (pp. 274-276). These policies

include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing.

You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test. Students often misunderstand what plagiarism is; therefore please make sure you understand what plagiarism is and how to avoid it. If you are unsure, please visit <http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>. All material taken from print, web, or other sources should be properly cited (author, date, source). Unless your instructor tells you otherwise, all work for this course should be written in your own words.