

Geology 101 - THE EARTH

Spring 2009

time: MWF 9:05-9:55 AM
place: Hasbrouck Lab 124
instructor: Professor Steven Petsch
office: Morrill IV-South, Room 265
office hours: Monday 10:00-11:00 AM, or by appointment
email: spetsch@geo.umass.edu
website: www.geo.umass.edu/faculty/petsch/Biogeochem_site/Teaching.htm

TEXTS:

1. *Exploring Geology* 1st edition, by Reynolds, Johnson, Kelly, Morin, Carter. (**required**)
2. *Laboratory Manual in Physical Geology*, by AGI/NAGT, Richard Busch, Editor. (**required**)

Textbooks are available at the UMass Textbook Annex

PHYSICAL GEOLOGY AS A GENERAL EDUCATION COURSE:

Welcome to The Earth. This is our home planet. This is where we live. We should understand **how** the Earth functions, **how** it is changing, and **how** its features shape human society. The goal of this course is to inspire interest and understanding of the features and processes that shape our global physical landscape on this rocky, watery sphere that is our home in the universe. You should leave this course with greater understanding about the age and composition of the earth, environments in which different rocks are found, processes that shape our landscape, and how these influence and shape our lives.

You have enrolled in a general education course designed to inform you about the features and functions of this planet. **You can expect** to become better at observing the world around you, at understanding of geological processes that shape our landscapes, at applying logic to natural phenomena, and at recognizing that geologic distributions of natural resources and hazards plays a large role in human society. Class meetings will be interactive, with numerous in-class activities. **You are expected** to maintain regular attendance, keep up with readings, complete in-class exercises and activities, hand in all assignments, and participate in discussions.

The **required one-day field trip** will travel a cross section through the Berkshires, which are one of the world's best-studied mountain belts. We will be outside all day, traveling by van to several distinct stops, nose on the rocks, gaining understanding about the rocks and landscape of Western Massachusetts. The **Report** on the Berkshire field trip is an answer sheet that you fill in during the trip and turn in at the end of the field trip.

ATTENDANCE ON THE FIELD TRIP IS REQUIRED TO PASS THIS COURSE, so please adjust your schedule now. The trip is offered two times during the semester: April 11 and April 19. You will need to sign up ahead of time for one of these trips to reserve your seat. Space is limited to 50 persons per trip. There is no make-up for this field trip

CLASS SCHEDULE:

The class schedule is subject to changes, depending on snow days, how long it takes for us to discuss topics, etc.

The dates of the mid-term examinations are fixed; material covered on these exams will be adjusted accordingly.

| No. | Day | Date | Subject | Chapter |
|------------|------------|-----------------|---|-----------------|
| 1 | M | Jan 26 | Investigating Geologic Questions – part I | Ch 2 |
| 2 | W | Jan 28 | Investigating Geologic Questions – part II | Ch 2 |
| 3 | F | Jan 30 | Plate Tectonics – part I | Ch 3 |
| 4 | M | Feb 2 | Plate Tectonics – part II | Ch 3 |
| 5 | W | Feb 4 | Earth Materials – part I | Ch 4 |
| 6 | F | Feb 6 | Earth Materials – part II | Ch 4 |
| 7 | M | Feb 9 | Igneous Environments – part I | Ch 5 |
| 8 | W | Feb 11 | Igneous Environments – part II | Ch 5 |
| 9 | F | Feb 13 | Volcanoes and Volcanic Hazards – part I | Ch 6 |
| | M | Feb 16 | (Holiday – President’s Day- no classes) | --- |
| 10 | W | Feb 18 | Volcanoes and Volcanic Hazards – part II | Ch 6 |
| 11 | F | Feb 20 | Sedimentary Environments – part I | Ch 7 |
| 12 | M | Feb 23 | Sedimentary Environments – part II | Ch 7 |
| 13 | W | Feb 25 | MIDTERM EXAM 1 | Ch 2-7 |
| 14 | F | Feb 27 | Rock Deformation and Metamorphism – part I | Ch 8 |
| 15 | M | March 2 | Rock Deformation and Metamorphism – part II | Ch 8 |
| 16 | W | March 4 | Geologic Time – part I | Ch 9 |
| 17 | F | March 6 | Geologic Time – part II | Ch 9 |
| 18 | M | March 9 | Geologic Time – part III | Ch 9 |
| 19 | W | March 11 | Seafloor and Continental Margins – part I | Ch 10 |
| 20 | F | March 13 | Seafloor and Continental Margins – part II | Ch 10 |
| | | March 16-20 | Spring Recess (no class) | --- |
| 21 | M | March 23 | Mountains, Basins and Continents – part I | Ch 11 |
| 22 | W | March 25 | Mountains, Basins and Continents – part II | Ch 11 |
| 23 | F | March 27 | Earthquakes and Earth’s Interior – part I | Ch 12 |
| 24 | M | March 30 | Earthquakes and Earth’s Interior – part II | Ch 12 |
| 25 | W | April 1 | Earthquakes and Earth’s Interior – part III | Ch 12 |
| 26 | F | April 3 | MIDTERM EXAM 2 | Ch 8-12 |
| 27 | M | April 6 | Climate and Weather – part I | Ch 13 |
| 28 | W | April 8 | Climate and Weather – part II | Ch 13 |
| 29 | F | April 10 | Climate and Weather - part III | Ch 13 |
| --- | Sat | April 11 | All day field trip to the Berkshires. Every student must go on this trip - either on this date or Sunday, April 19th | --- |
| 30 | M | April 13 | Glaciers and Sea Level – part I | Ch 14 |
| 31 | W | April 15 | Glaciers and Sea Level – part II | Ch 14 |
| 32 | F | April 17 | Weathering, Soils and Unstable Slopes – part I | Ch 15 |
| --- | Sun | April 19 | All day field trip to the Berkshires. Every student must go on this trip - either on this date or Saturday, April 11th | --- |
| 33 | M | April 20 | (Holiday - Patriots Day) | --- |
| 34 | T | April 21 | Weathering, Soils and Unstable Slopes – part II | Ch 15 |
| 35 | W | April 22 | Rivers and Streams – part I | Ch 16 |
| 36 | F | April 24 | Rivers and Streams – part II | Ch 16 |
| 37 | M | April 27 | Water Resources – part I | Ch 17 |
| 38 | W | April 29 | Water Resources – part II | Ch 17 |
| 39 | F | May 1 | MIDTERM EXAM 3 | Ch 13-16 |
| 40 | M | May 5 | Energy and Mineral Resources – part I | Ch 18 |
| 41 | W | May 6 | Energy and Mineral Resources – part II | Ch 18 |
| 42 | F | May 8 | The Carbon Cycle – part I | handouts |
| 43 | M | May 11 | The Carbon Cycle – part II | handouts |

COURSE GRADE:

| | |
|-----------------------------------|-------------|
| 3 Midterm Exams (each worth 10%): | 30 % |
| Cumulative Final Exam | 15 % |
| Weekly News & In-Class Exercises | 20 % |
| Weekly labs | 25% |
| Berkshire Field Trip and Report | 10 % |
| Total | 100% |

Each hour exam treats a separate block of material. Note the final exam is cumulative and *will cover material from the entire semester.*

WEEKLY NEWS & IN-CLASS EXERCISES

There are two components to weekly in-class activities and assignments you are expected to hand in each week. Together, these total 20% of your cumulative grade, and you must attend class to hand in these assignments.

- (1) The Earth Sciences are very well represented in the news media. One goal of this course is to inform your ability to appreciate and understand current events that are impacted by geology. Each week, you will be asked to read any news sources you would like, and to prepare a short (1-2 paragraph) summary of news you have found that relates to the Earth Sciences. These summaries will be handed in each Friday, and graded. You must attend class to hand in these summaries. As an opportunity for **extra credit**, you will also be invited at the end of each Friday's lecture to report to the class on news and current events that contain Earth Sciences content.
- (2) Additional in-class exercises and activities will be offered during lectures at least once each week. In-class exercises will be started and completed within the one-hour lecture. There are no make-ups for in-class activities, and no assignments can be handed in for grading after that class has ended.

MAKE-UP POLICY ON EXAMS:

This syllabus is provided so you can plan your semester accordingly. Please do not miss any exams. BUT, things happen ...

A student may miss one exam – and will need to make up the exam **within one week of the scheduled exam date.** Contact Prof. Petsch immediately once you have missed an exam. After three days, the exam score will be recorded as zero. Any subsequent missed exams will receive a zero grade. There is no make-up exam for the Final Exam.

CLASS MEETINGS:

This course is an introduction to the processes that result in the materials, structure and evolution of the earth. Attendance in class is expected and essential. Exams will stress concepts developed in class meetings. Also, attendance is required to receive credit for in-class exercises.

LABORATORY SECTIONS:

First LAB begins Monday, Feb. 2.

Go to your 1st lab section to obtain a syllabus and schedule for the labs and lab field trips. There will be exercises and assignments to be handed in during each laboratory session throughout the semester. Get to know your Graduate Teaching Assistant well. Locate her/his office in the department as soon as possible and know the office hours, whether or not you have problems. On field trips, wear boots and warm clothing; you will be going outside. In the event of steady rain/snow, indoor labs will be held.

THERE ARE NO SCHEDULED MAKE-UPS FOR LAB FIELD TRIPS. IF YOU MISS A FIELD TRIP LAB DURING YOUR ASSIGNED PERIOD, IT IS YOUR RESPONSIBILITY TO ATTEND ANOTHER LAB AND COORDINATE THE WORK DONE WITH YOUR LAB INSTRUCTOR!