

# GEOL 121: PHYSICAL GEOLOGY

## FALL 2013 – Sections 1 & 2

**Instructor:** Dr. Joel Moore  
**Office:** Smith 426F  
**Office Hours:** M 1:45 p – 2:45 p  
R 4:00 p – 5:00 p  
F 10:00 a – 11:00 a  
or by appointment  
**Phone:** 410.704.4245  
**Email:** moore@towson.edu  
**Mailbox:** Smith 445

**Lecture:** Smith Hall 356  
M W 12:00 p – 1:15 p

**Laboratory:** Smith Hall 473  
*Section 001* R 2:00 p – 4:45 p  
*Section 002* T 2:00 p – 4:45 p

### Required texts:

**Lecture:** Marshak, *Essentials of Geology* (3rd or 4th edition)  
Additional readings and materials on Blackboard  
CPS clickers

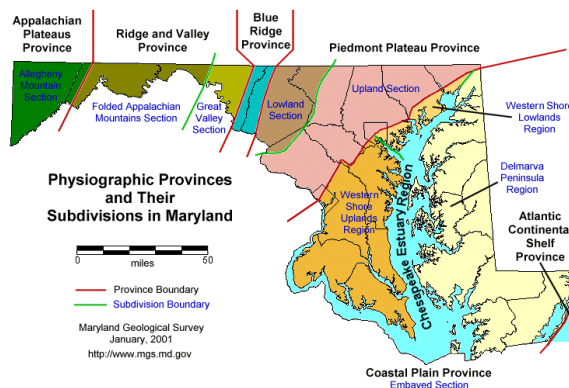
**Laboratory:** Lev, Rea, & Hermann, *Core Ideas in Physical Geology: An Inquiry-based Approach*.

**Catalog course description:** Composition and structure of the earth; the internal and external forces acting upon it and the surface features resulting. Laboratory studies of common rocks and minerals, geologic and topographic maps and aerial photographs. Field trips required. Three lecture hours and two laboratory hours per week. This four-credit course fulfills *General Education category IIA*, Scientific Inquiry and the *University Core Curriculum category 7*, Biological and Physical Sciences with laboratory.

### University Core Course Goals:

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

- Utilize scientific vocabulary and examples to describe major ideas appropriate to introductory geology.
- Use quantitative reasoning to analyze and/or support geological information.
- Identify, describe critique, respond to, and construct the various components of the scientific process such as observations, inferences, operational definitions, aspects of scientific design, conclusions, control of variables, etc.
- Explain scientific issues of current importance to society within scientific, technological, historical, societal and ethical contexts.



## Introduction:

Welcome to Physical Geology! Geology, and science in general, is not merely a set of facts, but rather a process and methodology for learning about the world in which we live. We will be learning about the Earth and how the closely interlinked spheres – atmosphere, biosphere, hydrosphere, and particularly the *geosphere* – have interacted throughout Earth history. Interaction between the four spheres continues currently shaping the Earth as we know it today including the air we breathe, water we drink, and soil/minerals/resources that allow us to eat and produce everything that we use. Hopefully in the process of learning geology you will gain an appreciation for the beauty and complexity of earth and the natural environment.

You will be participating in the scientific process as you make observations, form hypotheses, and start thinking about how you can test and quantify some of your hypotheses. In addition to lectures, this class will involve laboratory sessions, a field trip, and other hands-on exercises that will give you tangible experiences and to expose you to some of the skill sets used and some of the questions asked by geologists.

## Specific Course Goals

- 1) Students will use the vocabulary and concepts of geology, along with laboratory and field observations, to correlate rocks, sediments, and soils with the conditions under which they form and the tectonic and geomorphic processes that shape them into a landscape.
- 2) Students will build from what they have learned to evaluate and predict how the geological history of landscapes affects areas of societal and ethical concerns (*e.g.*, natural hazards, resources such as water and fossil fuels, ecosystem health). As students use geological thinking to assess societal concerns, they will participate in the inherently interdisciplinary nature of geology, which incorporates information from disciplines such as chemistry, physics, and ecology, and applies that knowledge in a unique way with the perspective of geological time to look at complex natural systems and develop hypotheses from incomplete datasets.
- 3) Throughout the course, students will learn about and begin to participate in the scientific process and will begin integrating scientific understanding with societal interactions with geological phenomena. Students will participate in discussions and reflection about the tremendous utility of the scientific process in advancing human knowledge and well-being along with discussions of the limits of science.

## Skill goals

Students will:

1. Define and identify the 3 major rock types and know the geological settings where each rock type forms.
2. Understand and describe the 3 major types of plate tectonic boundaries, examples of each type of boundary, and the geological forces that create each boundary.
3. Know what causes the three plate tectonics boundaries and know the layers of the earth.
4. Understand what causes volcanoes, earthquakes, and other phenomena associated with plate tectonics.
5. Comprehend and describe how soils form from rocks, why and how erosion occurs, how streams transport sediment and where sediment is deposited and definitions involved.
6. Apply your newfound knowledge to think through the implication of interactions between geological processes and human society, including *natural hazards* such as earthquakes and floods, *geological resources* such as fossil fuels and ground water, *human-induced changes* such as engineered landscapes and climate change.

## Attitudinal Goals

1. Improve student awareness of what geologists, and scientists, do.
2. Increase student interest in geology and science.

## Grading

The final course grade will be calculated using the following formula:

Lecture Exam 1	15%
Lecture Exam 2	15%
Lecture Exam 3	15%
Homework/study questions	13%
Lecture exercises & discussions	9%
Participation	8%
Lab Grade	25%

Grading Scheme:	A = 94.0-100%	A- = 90-93.9%
B+ = 87.0-89.9%	B = 84.0-86.9%	B- = 80.0-83.9%
C+ = 77.0-79.9%	C = 70.0-76.9%	
D+ = 67.0-69.9%	D = 60.0-66.9%	F = below 60%

Lecture exams will cover material from lectures and the book.

### *Lecture exercises & discussions*

We will spend time during several lecture periods on group and individual exercises where you will work, or discuss, in small groups. However, the final work that you hand in should be your own. You will also read a few essays and answer questions about those essays in preparation for in-class discussion. Readings for the discussions will be posted on Blackboard.

### *Participation*

**Respect your classmates.** Disturbing your classmates by talking, whispering, texting, music, etc. will result in you losing participation points for that class session. Your participation grades will be primarily based on the CPS clickers but also on your participation in group exercises and discussions. For the clickers, half the grade will come from attendance and half the grade will come from answering questions (though you do not have to have the right answer). However, if your answers are consistently incorrect, I may request that you come to my office hours for help. Up to 3 absences (because you are not present, do not answer questions, your clicker batteries die, etc.) will be automatically excused and do not require that you tell me about your absence.

### *Homework*

Reading homework will be open book. The homework is part of your grade as preparation to help you to succeed on exams and as an incentive to read.

## Lecture & laboratory schedule

The schedule for lecture topics, reading assignments, and exams is posted separately on Blackboard. A separate, brief syllabus and schedule for your laboratory sessions will be posted on Blackboard by your laboratory instructor.

## CLASS POLICIES

**Course communication:** Necessary course materials, in addition to the required text, will be available on Blackboard. You are responsible for anything sent by the instructor via email or posted on Blackboard. All email communication will be sent to university email accounts; you are responsible for checking your university email account frequently. In most cases allow 24 hours for an email response from me (and longer over weekends).

I am happy to meet during office hours if you have questions, and if those times do not work, please e-mail me to set up another time for us to meet. You are also welcome to email me with questions. *To help me distinguish your emails from those coming in from other classes, add "Geol 121" to the start of your subject line. Please use best practices in your email to me (and all faculty)—this includes signing off with your name, using full sentences, and not using text shorthand. This conveys an important sense of professionalism that's worth practicing for future jobs.*

**Attendance:** Students are expected to attend all lectures, labs, exams, and field trips as scheduled. Students are also advised to read each assignment prior to its discussion in class/lab. If you miss a lecture, you should get notes from a classmate. I will not provide notes or a summary of the class. There are no make-up exams except for documented medical or personal emergencies. If you have an emergency, contact me as soon as possible (moore@towson.edu or 410.704.4245) or notify the Department Administrative Assistant (410.704.3020).

**Late or Missed Assignments:** *There will be no make-up assignments or labs without either prior approval or an official documented excuse.* Late assignments will be penalized 10% if they are turned after the start of class on the due date, and 10% more for each subsequent day. You can turn in work late, but you will be penalized 10% per day—no exceptions. Note: the 3 discussion assignments are an exception because doing the reading ahead of time is necessary in order to have a good class discussion. Discussion assignments that are not completed by the beginning of class will be penalized 40% (or more if turned in subsequent to the due date). If you happen to fall sick on the due date, you should contact me immediately to discuss your options for turning it in by email, otherwise it will be considered late. If you turn assignments in to my mailbox, please send me an e-mail telling me as much, else I will mark it late based on when I find it. I do not go to my mailbox daily.

**Electronic Devices:** Cell phones, pagers, and other communication devices must be set to vibrate mode or turned off. Calls cannot be made or accepted during lecture or lab, nor should students text during lecture.

**Academic Dishonesty:** Academic Dishonesty, including cheating and plagiarism, will be dealt with in accordance with the Towson University Student Code of Conduct (See Undergraduate Catalog Appendix F). Academic Dishonesty will be reported to the PAGS Department Chair and the Office of the Registrar.

**Withdrawal Policy:** Students may withdraw from the course with the grade of W at any time prior to and including Wednesday, November 6, 2013.

*This course can only be repeated once for credit without permission from the Academic Standards Committee.*

**Students with disabilities:** This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Disability Support

Services (DSS), 7720 York Road, Suite 232, 410/704-2638 (Voice or TDD). Students who suspect that they have a disability but do not have documentation are encouraged to contact DSS for advice on how to obtain appropriate evaluation. A memo from DSS authorizing your accommodation is needed before any accommodation can be made.

**Diversity Mission Statement:**

The Department of Physics, Astronomy and Geosciences, in accordance with the Fisher College of Science and Mathematics Diversity Plan ([http://www.towson.edu/fcsm/diversity/diversity\\_action\\_plan.asp](http://www.towson.edu/fcsm/diversity/diversity_action_plan.asp)) and with the Towson University Strategic Plan, believes that we must support initiatives that promote diversity among FCSM faculty, staff and students while continuing to meet the workforce needs of the State of Maryland. To fulfill that vision, we are committed to increasing the quality and diversity of our students, faculty and staff while increasing retention and curriculum initiatives.

# GEOL 121: PHYSICAL GEOLOGY – SCHEDULE FALL 2013

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## Tentative Schedule

Week	Dates	Topic(s)	Chapter in text
1	W 08/28	<b>No in-person meeting.</b> Online lecture – Intro to geology & science; Solar system & formation of Earth	1
2	09/02	<b>Labor Day – No class</b>	
	09/04	Minerals & major rock types	3
3	09/09	Minerals (cont.)	
	09/11	Plate tectonics / Igneous rocks	2 / 4
4	09/16	Igneous rocks	
	09/18	Igneous rocks / Volcanism	5
5	09/23	Volcanism (cont.)	Interlude B
	09/25	Soils & sedimentary rocks	6
6	09/30	Sedimentary rocks	
	10/02	<b>Exam #1</b>	
7	10/07	Metamorphic rocks	7
	10/09	Rock cycle & <i>Discussion #1</i>	Interlude C
8	10/14	Mountain building & crustal deformation	9
	10/16	Earthquakes & tsunamis	8
9	10/21	Earth's Interior	Interlude D
	10/23	Rock Record	
10	10/28	Geologic time	Interlude E
	10/30	Earth history	10
11	11/04	<b>Exam 2</b>	
	11/06	Energy Resources	12
12	11/11	Energy Resources (cont.) & <i>Discussion 2</i>	
	11/13	Hydrologic cycle & Surface Water	14
13	11/18	Surface Water (cont.)	
	11/20	Groundwater	16
14	11/25	Groundwater (cont.)	
	11/27	<b>Thanksgiving – No class</b>	
15	12/02	Global climate	
	12/04	Global climate (cont.) & <i>Discussion #3</i>	19
16	12/09	Global climate (cont.)	
	12/11	Global climate (cont.)	

**Mon., 12/16, 3:00 – 5:00 pm: Exam 3 during final exam period**

**\*\* This schedule is subject to change with appropriate prior notification. \*\***