

LOYOLA MARYMOUNT UNIVERSITY
COLLEGE OF SCIENCE AND ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING AND ENVIRONMENTAL SCIENCE

**ENVS 300/500 GEOLOGY
FALL 2012 COURSE SYLLABUS
THURSDAY 6:00-9:00, PEREIRA 201**

Instructor: Dr. Freddi-Jo Bruschke

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Office hour: Tues & Thurs 5-6
Skype-able in a.m.
I will always be available after class

Course Description

This course is concerned with basic earth materials and processes with an applied emphasis. Topics include rock and mineral properties, earth structure and movements, earthquakes, volcanic processes, weathering and lithification, subsurface aqueous processes, landslides and mass wasting, river and marine deposits, and understanding of geologic hazards.

Prerequisites

No formal prerequisites, however students are expected to be familiar with basic physics and should be comfortable with basic mathematical computation.

Learning Outcomes

The student objectives for this course are to attain a basic knowledge of geology and geological language for better interaction with geologists as engineers and environmental scientists. At the end of this course, students should be familiar with geologic terminology and core concepts such as geologic time, relative and absolute dating, and plate tectonics. Students will also be able to identify rock and mineral types/properties and understand the processes of rock formation. Student will learn about rock and soil mechanics and be introduced to geologic maps. Students will further understand the processes that lead to changes of the earth's surface and subsurface that represent geologic hazards, such as earthquakes, volcanic eruptions, landslides, land subsidence, erosion and weathering, and groundwater contamination. Finally, through the examination of case histories, students will understand the application of these core geologic processes to engineering projects.

Textbook

Kehew, Alan. (2006). *Geology for Engineers & Environmental Scientists*. Prentice Hall: New Jersey.
ISBN: 0-13-145730-6

The text should be available from the LMU bookstore as a purchase or rental, and of course you can find it from on-line retailers. Other readings will be assigned as handouts in class or posted to Blackboard.

A really nice series of introductory geology videos from the Annenberg Foundation called Earth Revealed may be found at: <http://www.learner.org/resources/series78.html> Choose from the Video on Demand menu. These are an optional suggestion and will not be considered part of the testable course content.

ABET Criterion 3 Program Outcomes

The applicable ABET program outcomes addressed in ENVS 300 are:

- a. Ability to apply knowledge of mathematics, science, and engineering

- b. Ability to design a system, component, or process to meet desired needs with realistic constraints such as economic, environmental, social, health and safety, manufacturing and sustainability
- c. Ability to identify, formulate, and solve engineering problems
- d. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practices.

Grading and Student Responsibilities

There will be many (4-5) short quizzes given in this class to help students keep up with the material presented. The final exam will be cumulative. Make-up exams will not be given except in case of documented emergency. The term project for this class will be research (in teams) of an engineering geology case study. Each team will present their case study to the rest of the class and each individual on the team will submit a written report.

Homework/in-class exercises	25%
Quizzes	20%
Case Study/Term Project	15%
Final and Mid-Term Exam	40%

Final grades will be assigned as: A 100-93%, A- 90-93%, B+ 87-90%, B 82-87%, B- 80-82%, C+ 77-80%, C 72-77%, C- 70-72%, D+ 67-70%, D 62-67%, D- 60-62%, F <60%.

Students are expected to check Blackboard on a regular basis for current information about this class.

Assignment submissions will be accepted as hardcopy in class as well as through Blackboard.

Academic Integrity

Academic dishonesty is treated as an extremely serious matter at LMU, with consequences that can range from receiving no credit for assignments/tests to expulsion. It is never permissible to turn in any work that has been copied from another student or copied from a source (including the Internet) without properly acknowledging the source. It is your responsibility to make sure that your work meets the standard of academic honesty set forth in the "LMU Honor Code and Process" in the LMU Bulletin 2008-2010. See http://www.lmu.edu/about/services/registrar/Bulletin/Academic_Degree_Requirements_and_Policies.htm

Special Accommodations

Students with special needs who need reasonable modifications, special assistance, or accommodations in this course should promptly direct their request to the Disability Support Services Office. Any student who currently has a documented disability (physical, learning, or psychological) needing academic accommodations should contact the Disability Services Office (Daum Hall # 224, x84535) as early in the semester as possible. All discussions will remain confidential. Please see <http://www.lmu.edu/dss> for additional information.

Expectations for Classroom Behavior: Disruptive behavior which is persistent or significantly interferes with classroom activities may be subject to disciplinary action. A student may be referred to the Office of Student Judicial Affairs if their behavior constitutes a violation of the conduct code. Cell phones should be turned off or set to silent mode.

Evolving Syllabus: It is possible and likely that revisions will be made to this syllabus during the semester in order to meet the needs of the class and appropriately cover the course material. Students will be given fair notification of significant changes.

Questions? Please do feel free to contact me with questions/concerns/problems/input.

Schedule

		Topic(s)	Reading	Assignment
1	Aug 30	Introduction to Eng Geo Overview of Geologic Hazards Formation of the Earth Plate Tectonics In-class activity: Plate Tectonic Puzzle	K: Ch1 & 2	HW 01 Geology at Plate Boundaries
2	Sept 6	Geologic Time Rock Cycle Mineral Classification and Uses In-class activity: Mineral Identification	K: Ch3	HW 02 Geologic Time and Radiometric Dating of Rocks
3	Sept 13	Minerals Structure and Major Groups Igneous Rocks & Properties Intrusive Processes In-class activity: Igneous Rock Identification	K: Ch 4	HW 03 Mineral Comparisons/Virtual Mineral Identification
4	Sept 20	QUIZ 1 Volcanic Processes and Hazards Sedimentary Rocks Characteristics In-class activity: Sedimentary Rock ID	K:Ch 4	
5	Sept 27	Sedimentary Processes Depositional Environments Relative Dating Principles In-class activity: Relative Dating	K:Ch 5	HW 04 Relative Dating Exercises
6	Oct 4	Metamorphic Rocks & Properties Metamorphic Environments Topographic Maps & Block Diagrams	K: Ch 6	HW 5 Sedimentary and Metamorphic Environments
7	Oct 11	Geologic Maps (continued) Weathering and Erosion	K: Ch 9	HW 06 Topographic Maps
8	Oct 18	Mid-Term Exam Structural Deformation In-class activity: Playdough Folds	K: Ch 8	
9	Oct 25	Rock Mechanics	K: Ch 7	HW 07 Block Diagrams
10	Nov 1	Earthquakes Faults Seismic Waves In-class activity: Virtual Earthquake In-class demo: Elastic Rebound	K: Ch 8	HW 08 Rock Mechanics/Mohr Circle Calculations
11	Nov 8	Quiz 2 Mass Wasting Slope Stability/Safety Factor Soils Case Study Selection	K: Ch 10 & 13	HW 09 Seismic Wave Calculations
12	Nov 15	Groundwater	K: Ch 11	HW 10 Groundwater basin analysis
13	Nov 22	THANKSGIVING		
14	Nov 29	Streams and fluvial processes Oceans and Shoreline Processes	K: Ch 14&15	
15	Dec 6	CA Hazard Case Study Presentations Geology of California		