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Fall 9-1-2018

GEO 103N.01: Introduction to Environmental Geology

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Class meeting times: Monday, Wednesday, Friday 14:00-14:50

Course Outcomes: The fundamental goal of this class is to formally introduce you to your planet –(the Earth), the natural processes which shape your world and help you understand how you and your planet interact. After this course:

- 1) You will know general principles of environmental geology including: the spatial and temporal scales of the Earth, the Earth's principal materials (minerals, rocks, water, air), causes and controls of natural hazards, source and fate water and air pollution, how we get energy, water, and food, and how humans effect these systems.
- 2) You will be able to understand the basic cycles controlling earth processes.
- 3) You will know how humans modify natural cycles, the consequences of those modifications and the ways which we try to mitigate those consequences.
- 4) You will be able to identify basic methods and activities geologists use to gather, validate, and interpret environmental data.
- 5) You will be able to demonstrate basic data interpretation skills. You will be able to formulate hypotheses, detect patterns in environmental data, test hypotheses and draw conclusions.
- 6) You will understand the means by which uncertainty is quantified and expressed in environmental geology. You will be able to describe what is meant by scientific uncertainty and how uncertainty is incorporated into environmental geology.

Gardner Office Hours: Monday 13:00-14:00 p.m. or by appointment

Moodle Web Site: Aside from lectures, Gardner office hours, and scheduled appointments, formal communications relative to class content and announcements will be handled through the course moodle page and the UM email system.

Course Grading System: Final grades for this course will be based on class attendance, participation, midterm and final exams and field trip attendance. The break down is as follows:

5% course attendance: Each lecture is required. You are permitted to miss three (3) lectures without any penalty, but attendance will be taken at the beginning of every lecture via TopHat.

10%: TopHat questions and other exercises during each lecture: Each lecture, TopHat questions and inclass excercises will be posed for participation credit. questions will be used to assess participation and how well the class is understanding the concepts covered.

25%: Midterm Exam 1: Friday, Sept 28

25% Midterm Exam 2: Wednesday, October 31

25% Final Exam, **Tuesday, December 11 at 1:10 pm**

Each midterm exam will consist of 50 multiple choice questions. The final exam will consist of 100 multiple choice questions.

Field Trip: 10% field trip exercise: This course will have one all-day Saturday field trip to the Upper Clark Fork Valley Superfund Site. The trip will involve a field exercise that will be collected and scored.

Course Book: This course will utilize the textbook Environmental Geology (10th ed.) by Carla W. Montgomery. The book is available through the UM Bookstore. In addition to course content delivered via lectures, you are responsible for keeping up with the assigned reading. Class is a time to do exercises, have dialogue, and interact with professor to actively learn the content. Reading should be done before class. I will not cover all topics in lecture, reading is a must. There will be questions and quizzes. **DO YOUR READING FIRST** and come to class prepared.

Weekly Course Schedule:

<u>Weekday/Date:</u>	<u>Lecture/discussion topic</u>	<u>Assigned Reading</u>
Week 1		
Monday, August 27	Course introduction, pre-course assessment	Montgomery, Ch. 1
Wednesday, August 29	Earth in space and time	
Friday, August 31	Impact of the Human Population on Earth	
Week 2		
Monday, September 3	NO CLASS, Labor Day Holiday	
Wednesday, September 5	Intro to matter and solid earth materials (Nick)	Montgomery, Ch. 2
Friday, September 7	Minerals, silicates and non-silicates (Nick?)	
Week 3		
Monday, September 10	Plate tectonics – an overview	Montgomery, Ch. 3
Wednesday, September 12	Evidence supporting plate tectonics	
Friday, September 14	Plate movements – how far? how fast?	
Week 4		
Monday, September 17	Earthquake Theory	Montgomery, Ch. 4
Wednesday, September 19	Earthquake severity, hazards, and forecasting	
Friday, September 21	Volcanoes and volcanic processes	Montgomery, Ch. 5
Week 5		
Monday, September 24	Volcanic hazards (Nick)	
Wednesday, September 26	Forecasting volcanic eruptions	
Friday, Sept 28	Midterm Exam 1 – through volcanic hazards	
Saturday, September 29 – all day (9-5) field trip to upper Clark Fork Superfund Site		
Week 6		
Monday, October 1	The Hydrologic Cycle, intro to streams	Montgomery, Ch. 6
Wednesday, October 3	Flooding and consequences	
Friday, October 5	Coastal processes	Montgomery, Ch. 7
Week 7		
Monday, October 8	Coastline erosion and stabilization	
Wednesday, October 10	Mass movements and slope stability	Montgomery, Ch. 8
Friday, October 12	Types of mass movements and human impacts	
Week 8		
Monday, October 15	Global climate change	Montgomery, Ch. 9
Wednesday, October 17	Global climate change	
Friday, October 19	Groundwater storage and mobility	Montgomery, Ch. 10

Week 9		
Friday, October 22	Water use and water supply	
Friday, October 24	Impacts of groundwater withdrawal	
Monday, October 26	Soil formation and basic properties	Montgomery, Ch. 11
Week 10		
Monday, October 29	Soils and human activities	
Wednesday, October 31	Midterm Exam 2 – through soil	
Friday, November 2	Mineral and rock resources	Montgomery, Ch. 12
Week 11		
Monday, November 5	Environmental impacts of mining	
Wednesday, November 7	Energy resources – fossil fuels	Montgomery, Ch. 13
Friday, November 9	Environmental impacts of fossil fuels	
Week 12		
Monday, November 12	NO CLASS – Veteran's Day Holiday	
Wednesday, November 14	Alternative energy resources	Montgomery, Ch. 14
Friday, November 16	Alternative energy resources, continued	
Week 13		
Monday, November 19	Solid waste disposal	Montgomery, Ch. 15
Wednesday, November 21	No class – Student travel day	
Friday, November 23	No class – Thanksgiving Holiday	
Week 14		
Monday, November 26	Liquid waste disposal	
Wednesday, November 28	Water Pollution, basic principles	Montgomery, Ch. 16
Friday, November 30	Water pollution mitigation and clean up	
Week 15		
Monday, December 3	Air pollution	Montgomery, Ch. 17
Wednesday, December 5	Air pollution mitigation	
Friday, December 7	Course review, course evaluation	
Final Exam	Tuesday, December 11 at 1:10 pm	Final is comprehensive

An important note about academic misconduct:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://www.umt.edu/vpsa/policies/student_conduct.php.

Disabilities

Students with disabilities may request reasonable modifications by contacting me. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. Reasonable means the University permits no fundamental alterations of academic standards or retroactive modifications.