

Class meeting times: Monday, Wednesday, Friday 2:00 – 2:50 pm

Course Summary: 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. In this course we will cover the basics of geology from the formation of the Earth and processes that continue to change the Earth's surface to groundwater processes to geologic resource location and extraction. However, while we cover this material, we will focus on how humans are affected by these processes as well as the effect of human actions on these processes.

Course Outcomes: 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 of water and air pollution, how we get energy, water, and food, and how humans affect 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.

Brown Office Hours: Monday 1:00-2:00 p.m. or by appointment

Moodle Web Site: Aside from lectures, Brown 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 participation, in-class assignments, quizzes, 2 midterms, 1 final exam, and a final research project. The breakdown is as follows:

25%: Class participation, quizzes, and in-class assignments. Although I will not be taking attendance, you will regularly be working on in-class projects that will be graded. Further, there will be material covered in class that is not covered in the textbook, attendance is strongly recommended.

15%: Midterm Exam 1: Friday, September 27

15%: Midterm Exam 2: Wednesday, October 30

20%: Final Exam, **3:20 – 5:20 Tuesday, December 10**

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

25%: Final research project: This project is intended as a platform for you to show that you understand the topics covered in the class, how the topics covered in the class are related to each other, and the effects of the interactions of humans with the physical world.

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 in class that cover the material in the assigned reading. **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 26	Course introduction, Pre-course assessment	
Wednesday, August 28	Earth in space and time, Timeline	Montgomery, Ch. 1
Friday, August 30	Human Population on Earth, Resources	
Week 2		
Monday, September 2	<i>Labor Day – NO CLASS</i>	
Wednesday, September 4	Matter and solid earth materials	Montgomery, Ch. 2
Friday, September 6	Earth materials telling a story, Relative age	
Week 3		
Monday, September 9	Plate tectonics: Compiling evidence	Montgomery, Ch. 3
Wednesday, September 11	Plate tectonics: Hypothesis to theory, Deformation	
Friday, September 13	Plate tectonics, Google earth project	
Week 4		
Monday, September 16	Earthquake Theory	Montgomery, Ch. 4
Wednesday, September 18	Earthquake severity, hazards, and forecasting	
Friday, September 20	Volcanoes and volcanic processes	Montgomery, Ch. 5
Week 5		
Monday, September 23	Volcanic hazards	
Wednesday, September 25	Forecasting volcanic eruptions, midterm review	
Friday, September 27	Midterm Exam 1 – through volcanic hazards	
Week 6		
Monday, September 30	The Hydrologic Cycle, Streams	Montgomery, Ch. 6
Wednesday, October 2	Flooding and consequences	
Friday, October 4	Oceans, Coasts, and Coastal processes	Montgomery, Ch. 7
Week 7		
Monday, October 7	Coastline erosion and stabilization	
Wednesday, October 9	Mass movements and slope stability	Montgomery, Ch. 8
Friday, October 11	Types of mass movements and human impacts	

Week 8		
Monday, October 14	Global climate change, Data	Montgomery, Ch. 9
Wednesday, October 16	Global climate change, Glaciers and icesheets	
Friday, October 18	Glacial deposits and melt impacts	
Week 9		
Monday, October 21	Groundwater storage, mobility, use and supply	Montgomery, Ch. 11
Wednesday, October 23	Groundwater landforms	
Friday, October 25	Deserts, weathering, erosion, and soils	Montgomery, Ch. 12
Week 10		
Friday, October 28	Soils and human activities, midterm review	
Friday, October 30	Midterm Exam 2 – through soil	
Monday, November 1	Mineral and rock resources, Mineral usage	Montgomery, Ch. 13
Week 11		
Monday, November 4	Mineral and rock resources, Electric cars	
Wednesday, November 6	Mining, Human interaction w/ the physical world	
Friday, November 8	Energy resources: Energy demand and fossil fuels	Montgomery, Ch. 14
Week 12		
Monday, November 11	<i>Veterans Day – NO CLASS</i>	
Wednesday, November 13	Energy resources: Fossil fuels and meeting demand	
Friday, November 15	Energy resources: Renewable energy resources	Montgomery, Ch. 15
Week 13		
Monday, November 18	Energy resources: Renewable energy resources II	
Wednesday, November 20	Nuclear energy, Electricity mixture to meet demand	
Friday, November 22	Daily human interaction with the physical world	
Week 14		
Monday, November 25	Waste Management	Montgomery, Ch. 16
Wednesday, November 27	<i>Thanksgiving break – NO CLASS</i>	
Friday, November 29	<i>Thanksgiving break – NO CLASS</i>	
Week 15		
Monday, December 2	Water Pollution	Montgomery, Ch. 17
Wednesday, December 4	Air pollution, course review	Montgomery, Ch. 18
Friday, December 6	Course review, course evaluation	
Final Exam	Tuesday, December 10, 3:20-5:20 p.m.	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.