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Fall 9-1-2018

GEO 107N.50: Natural Disasters

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Geo 107N – Natural Disasters | Fall 2018 \$

Instructor information

Instructor: Dr. Hilary Martens || Office: CHCB 329/330 || Distance Learning (WWW)
 Email: hilary.martens@umontana.edu || Phone: 406.243.6855 || Office hours: By appointment

Course description:

Earth is a dynamic planet that generates energy internally and acquires energy from outside sources. The concentration and release of energy due to natural processes can cause catastrophic destruction and loss of life. The Earth currently supports a human population of over 7 billion, and the population continues to grow. Understanding the science and risks behind natural disasters can help us to prepare for and mitigate the impact of destructive events. In this course, we will explore many of the most common natural disasters and the forces that drive them. In particular, we will study plate tectonics, earthquakes, volcanoes, tsunamis, tornadoes, hurricanes, climate change, floods, fires, landslides, avalanches, and impacts with space objects.

Learning Outcomes:

By the end of the course, students should be able to:

1. Describe the causes and consequences of plate tectonics and the transfer of energy between Earth systems
2. Differentiate between natural hazards, disasters, and risks
3. Describe the physical processes that drive a wide variety of natural disasters
4. Develop plans for personal preparedness in their own communities
5. Assess natural hazards in the environment based on previous natural events and physical characteristics
6. Consider how natural events can trigger or exacerbate other natural events
7. Discuss best practices for mitigating economic losses and human casualties from future natural disasters
8. Appreciate the impact of natural hazards on society and the role that science can play in hazard mitigation

Required textbooks:

Hyndman & Hyndman (2017), *Natural Hazards and Disasters*, 5th Ed., Cengage Learning *
 [Access codes are available from the UM Bookstore] *

Course Calendar:

Dates	Topic	Assignments and Due Dates
08/27 – 08/31	Human Populations	Readings, Discussion Questions, and Daily Quizzes
27 August	Unit 1: Energy Sources	
29 August	Unit 1: Human Population	
31 August	Unit 1: Education and Economics	
09/03 – 09/07	Plate Tectonics	Readings, Discussion Questions, and Daily Quizzes
03 September	Labor Day – No Class	
05 September	Unit 2: Earth Structure	
07 September	Unit 2: Plate Boundaries	
09/10 – 09/14	Earthquakes I	Readings, Discussion Questions, and Daily Quizzes
10 September	Unit 2: Sea-Floor Spreading	
12 September	Unit 3: Faults	
14 September	Unit 3: Seismology	Available: Midterm Exam 1
09/17 – 09/21	Earthquakes II	Readings, Discussion Questions, and Daily Quizzes
17 September	Unit 3: Earthquake Magnitude and Intensity	
19 September	Unit 4: Earthquake Forecasting	
21 September	Unit 4: Earthquake Hazard and Risk	
09/24 – 09/28	Tsunamis	Readings, Discussion Questions, and Daily Quizzes
24 September	Unit 4: Earthquake Early Warning	
26 September	Unit 5: Physics of Tsunamis	
28 September	Unit 5: Tsunami Effects and Mitigation	Due: Midterm Exam 1
10/01 – 10/05	Volcanoes	Readings, Discussion Questions, and Daily Quizzes
01 October	Unit 6: What are Volcanoes?	
03 October	Unit 6: Volcanic Eruptions	

Dates	Topic	Assignments and Due Dates
05 October	Unit 6: Volcano Hazards	Due: Project 1
10/08 – 10/12	Mass Movements	Readings, Discussion Questions, and Daily Quizzes
08 October	Catch-up / Independent Study Day	<i>Opportunity to work on projects, readings, exams, and quizzes</i>
10 October	Unit 7: Causes of Mass Movements	
12 October	Unit 7: Types of Mass Movements	Available: Midterm Exam 2
10/15 – 10/19	Atmosphere and Oceans	Readings, Discussion Questions, and Daily Quizzes
15 October	Unit 8: Earth's Water Cycle	
17 October	Unit 8: Ocean-Atmosphere Interactions	
19 October	Unit 8: Monsoons and Mountain Winds	
10/22 – 10/26	Severe Weather and Storms	Readings, Discussion Questions, and Daily Quizzes
22 October	Unit 9: Drought and Heat Waves	
24 October	Unit 9: Severe Storms	
26 October	Unit 9: Tornadoes	Due: Midterm Exam 2
10/29 – 11/02	Climate Change	Readings, Discussion Questions, and Daily Quizzes
29 October	Unit 10: Principles of Climate	
31 October	Unit 10: Climate History	
02 November	Unit 10: Mitigation of Climate Change	
11/05 – 11/09	Floods	Readings, Discussion Questions, and Daily Quizzes
05 November	Unit 11: Stream Flow	
07 November	Unit 11: Flood Intensity	
09 November	Unit 11: Mitigating Flood Damage	Available: Midterm Exam 3
11/12 – 11/16	Hurricanes	Readings, Discussion Questions, and Daily Quizzes
12 November	Veterans Day Observed – No Class	
14 November	Unit 12: Hurricane Formation	
16 November	Unit 12: Hurricane Damages	Due: Project 2
11/19 – 11/23	Break	
19 November	Catch-up / Independent Study Day	<i>Opportunity to work on projects, readings, exams, and quizzes</i>
21 November	Student Travel Day – No Class	
23 November	Thanksgiving Break – No Class	
11/26 – 11/30	Wildfires	Readings, Discussion Questions, and Daily Quizzes
26 November	Unit 13: Causes and Stages	
28 November	Unit 13: Spread of Fires	
30 November	Unit 13: Montana Wildfires	Due: Midterm Exam 3
12/03 – 12/07	Impacts with Space Objects	Readings, Discussion Questions, and Daily Quizzes
03 December	Unit 14: Space Objects	
05 December	Unit 14: Historic Impacts	
07 December	Unit 14: Risk of Impacts	Available: Final Exam
10-14 December	Final Exam	Final Exam (Due: Friday 14 December 2018 by 5 pm)

Required assignments and exams:

1. Daily Readings: You are expected to complete daily readings as you proceed through the course.
2. [10%] Project 1: Current Event
3. [15%] Project 2: Interview a Community Leader
4. [10%] Midterm Exam 1: Human Populations, Plate Tectonics, Earthquakes I, Earthquakes II
5. [10%] Midterm Exam 2: Tsunamis, Volcanoes, Mass Movements, Atmosphere and Oceans
6. [10%] Midterm Exam 3: Severe Weather and Storms, Climate Change, Floods, Hurricanes
7. [15%] Final Exam: Comprehensive
8. [20%] Daily Quizzes: You may re-take the daily quizzes as many times as you wish; I will take your highest scores.
9. [10%] Discussion Questions: You will be awarded full credit when your responses are on topic and complete.

Course guidelines and policies:

Student Conduct Code

All students are expected to abide by The University of Montana's Student Conduct Code:
https://www.umt.edu/vpsa/policies/student_conduct.php

Attendance

Regular participation in online course exercises is expected. If you need to miss or delay an activity, please inform me in advance.

Course withdrawal

Please refer to Institute policy on adding, dropping, and withdrawing from courses:
<https://www.umt.edu/registrar/students/dropadd.php>

Disability modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Assignment expectations

Readings, quizzes, projects, exams and other course activities are expected to be completed thoughtfully and on-time.

Honor Code: "No member of the community shall take unfair advantage of any other member of the community." *

Plagiarism: Reproducing the work of someone else, and representing the work as your own, without appropriate citation and * attribution is forbidden. Plagiarism extends beyond tangible material to also include ideas. When in doubt, cite. *

Collaboration: Since the course is fully on-line, peer-to-peer collaboration will not look the same as in other courses. Although you * are welcome and encouraged to discuss general course materials with your fellow classmates, it is expected that you complete the readings, daily quizzes, discussion questions, term projects, and exams on your own. Please respect and uphold the Honor Code.

More information on UM's academic policies and procedures:
http://archive.umt.edu/catalog/14_15/academics/academic-policy-procedure.php

Grading policy

Project 1:	10%		Project 2:	15%
Daily Quizzes:	20%		Discussion Questions:	10%
Midterm Exams:	30% (3 x 10%)		Final Exam:	15%

Late assignments will **not** be accepted. It is recommended that you begin assignments early and keep track of due dates. Daily quizzes will be graded, but you may re-take them as many times as you like, and I will only keep your highest scores. Responses to Discussion Questions will not be graded for specific content, but they must be on topic and written in complete sentences.

Additional Information and resources

Student Academic Resources *

Disability Services for Students (DSS): <http://www.umt.edu/dss/> *
The Writing Center: <http://www.umt.edu/writingcenter/> *
Office for Student Success: <http://www.umt.edu/oss/> *
Career Services: <http://www.umt.edu/career/> *
Mansfield Library: <http://www.lib.umt.edu> *

Student Health and Wellbeing *

Curry Health Center (mental health, physical health, pharmacy, health promotion): <http://www.umt.edu/curry-health-center/> *
Campus Recreation: <http://www.umt.edu/crec/> *
DiverseU: <http://www.umt.edu/diverseu/> *
Student Activity Groups: http://www.umt.edu/asum/student_groups/ *