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Spring 2-1-2019

GEO 107N.50: Natural Disasters

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Geo 107N – Natural Disasters | Spring 2019 \$

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 directly from Cengage or the UM Bookstore; Links in Moodle will take you to the registration page]

Course Calendar:

* Schedule is subject to change; although changes are unlikely.

Dates	Topic	Assignments and Due Dates
01/10 – 01/11	Welcome	
11 January	Syllabus; Getting started with e-book	Access Moodle; Syllabus quiz; Getting to Know You Forum
01/14 – 01/18	Human Populations	Readings, Discussion Questions, and Practice Quizzes
14 January	Unit 1: Energy Sources	
16 January	Unit 1: Human Population	
18 January	Unit 1: Education and Economics	
01/21 – 01/25	Plate Tectonics	Readings, Discussion Questions, and Practice Quizzes
21 January	Martin Luther King Jr. Day – No Class	
23 January	Unit 2: Earth Structure	
25 January	Unit 2: Plate Boundaries	
01/28 – 02/01	Plate Tectonics / Earthquakes I	Readings, Discussion Questions, and Practice Quizzes
28 January	Unit 2: Sea-Floor Spreading	
30 January	Unit 3: Faults	
01 February	Unit 3: Seismology	Reminder: Midterm Exam 1 Deadline Approaching
02/04 – 02/08	Earthquakes I / Earthquakes II	Readings, Discussion Questions, and Practice Quizzes
04 February	Unit 3: Earthquake Magnitude and Intensity	
06 February	Unit 4: Earthquake Forecasting	
08 February	Unit 4: Earthquake Hazard and Risk	
02/11 – 02/15	Earthquakes II / Tsunamis	Readings, Discussion Questions, and Practice Quizzes
11 February	Unit 4: Earthquake Early Warning	
13 February	Unit 5: Physics of Tsunamis	
15 February	Unit 5: Tsunami Effects and Mitigation	Due: Midterm Exam 1

Dates	Topic	Assignments and Due Dates
02/18 – 02/22	Volcanoes	Readings, Discussion Questions, and Practice Quizzes
18 February	Presidents' Day – No Class	
20 February	Unit 6: What are Volcanoes?	
22 February	Unit 6: Volcanic Eruptions	Due: Project Part 1
02/25 – 03/01	Volcanoes / Mass Movements	Readings, Discussion Questions, and Practice Quizzes
25 February	Unit 6: Volcanic Hazards	
27 February	Unit 7: Causes of Mass Movements	
01 March	Unit 7: Types of Mass Movements	Reminder: Midterm Exam 2 Deadline Approaching
03/04 – 03/08	Atmosphere and Oceans	Readings, Discussion Questions, and Practice Quizzes
04 March	Unit 8: Earth's Water Cycle	
06 March	Unit 8: Ocean-Atmosphere Interactions	
08 March	Unit 8: Monsoons and Mountain Winds	
03/11 – 03/15	Severe Weather and Storms	Readings, Discussion Questions, and Practice Quizzes
11 March	Unit 9: Drought and Heat Waves	
13 March	Unit 9: Severe Storms	
15 March	Unit 9: Tornadoes	Due: Midterm Exam 2
03/18 – 03/22	Climate Change	Readings, Discussion Questions, and Practice Quizzes
18 March	Unit 10: Principles of Climate	
20 March	Unit 10: Climate History	
22 March	Unit 10: Mitigation of Climate Change	Reminder: Midterm Exam 3 Deadline Approaching
03/25 – 03/29	** SPRING BREAK **	
25-29 March	Spring Break – No Class	
04/01 – 04/05	Floods	Readings, Discussion Questions, and Practice Quizzes
01 April	Unit 11: Stream Flow	
03 April	Unit 11: Flood Intensity	
05 April	Unit 11: Mitigating Flood Damage	Due: Project Part 2
04/08 – 04/12	Hurricanes	
08 April	Catch-up / Independent Study Day	<i>Opportunity to work on readings, exams, and quizzes</i>
10 April	Unit 12: Hurricane Formation	
12 April	Unit 12: Hurricane Damages	
04/15 – 04/19	Wildfires	Readings, Discussion Questions, and Practice Quizzes
15 April	Unit 13: Causes and Stages	
17 April	Unit 13: Spread of Fires	
19 April	Unit 13: Montana Wildfires	Due: Midterm Exam 3
04/22 – 04/26	Impacts with Space Objects	Readings, Discussion Questions, and Practice Quizzes
22 April	Unit 14: Space Objects	
24 April	Unit 14: Historic Impacts	
26 April	Unit 14: Risk of Impacts	Available: Final Exam
04/29 – 05/03	Final Exam	Final Exam (Due: Friday 3 May 2019 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: Part 1 – Community Interview
3. [15%] Project: Part 2 – Interview Analysis
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 Part 1:	10%		Project Part 2:	15%
Practice 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/ *