

Course Title:	Natural Disasters: Science and Society
Course Code:	CLD9012
No. of Credits/Term:	3 credits per term
Mode of Tuition:	Sectional
Class Contact Hours:	3 hours/week split into two 1.5 hour classes
Category in Major Prog.:	Science, Technology Mathematics and Society
Prerequisite:	Not applicable
Co-requisite:	Not applicable
Exclusion:	Not applicable
Exemption Requirements:	Not applicable

Brief Course Description:

This course will explore the science of natural disasters (such as earthquakes, volcanos, and tsunamis) and natural disturbances (such as forest/grass fires, hurricanes, and floods) and the impacts that these events have on natural ecosystems and human societies.

Aims:

This course will (1) introduce the scientific method, (2) examine the differences between disasters and disturbances, (3) explore how the study of plate-tectonics can help us understand disasters such as earthquakes, volcanos, and tsunamis, (4) discuss the causes and effects of disturbances such as hurricanes, fires, and flood, (5) examine the effects of disasters and disturbances of human societies, and (6) explore how negative effects of these events can be minimized by prediction and mitigation.

Learning Outcomes:

By the end of this course a fully-engaged student should be able to

1. Describe how the scientific method is used to investigate natural phenomena and apply it to answer scientific questions. Discuss how knowledge of the scientific method and peer review should help them evaluate the validity of arguments and the reliability of sources of information.
2. Describe the modern theory of plate tectonics and then **apply** this knowledge to understanding the different types of seismic faults, **describing** how each causes earthquakes
3. Describe the role of plate tectonics and other causes of the many types of volcanoes.
4. Describe the role of plate tectonics and other **causes** of tsunami.
5. Describe the causes of tropical cyclones such as typhoons

6. Students will **compare and contrast** the methods of mitigation for each natural disaster covered in class and be able to **evaluate** how effective each method is.

Assessment:

Quizzes	40%
Class participation/writing assignments	20%
-science project	
Term paper	15%
Final Quiz	25%

Indicative Content:

Scientific method
Wegener and his postulation of the theory of plate tectonics
The theory of plate tectonics
Earthquakes and plate tectonics
Faults: normal faults, strike-slip faults, thrust faults, reverse faults
Earthquake waves and magnitude
Tsunami and plate tectonics
Volcanoes and plate tectonics
Volcanoes and magma
Disturbance regime
Hurricanes, floods and fires
Risk assessment and disasters
Mitigation and disasters
Prediction of disasters

Teaching Method: Lecture, film, discussion, use of internet resources, class participation exercises

Measurement of Learning Outcomes:

Quizzes: Students will demonstrate mastery of lecture concepts by answering short questions (Learning outcomes 1, 2, 3, 4, 5)

Class participation: Students will answer questions that will allow them (in a group and on their own) to practice and reinforce the lecture material. Students will report on the results of a “scientific investigation” conducted in class. (Learning outcomes 1, 2, 3, 4, 5).

Term paper: Choose an example of a specific natural disaster and explain to a non-expert (1) the cause of that type of disaster in general, (2) the physical conditions that led to your specific natural disaster, (3) how the specific natural disaster affected the local people, environment,

and society, and (4) what lessons have we learned about how to avoid or to minimize the effect of such events. (Learning outcomes 2, 3, 4, 5)

Final Quiz: All of the material covered during the semester can appear on the final quiz. Students will answer short questions and essay questions on the final quiz. (Learning outcomes 1-5)

Required/Essential Readings:

Required readings will be available on the course moodle.

“Students shall be aware of the University regulations about dishonest practice in course work and the possible consequences as stipulated in the Regulations Governing University Examinations.”

Tentative Course Outline

Week 1. September 2	Intro
Week 2. September 7 - 9	Intro to Science and Natural Disasters
-	<u>Assignment 1. Why learn about science (due Friday in class)</u>
Week 3. September 14	Plate Tectonics
Week 4. September 21 - 23	Volcanoes
-	<u>Mini Quiz Plate Tectonics (Thursday)</u>
Week 5. September 28 - 30	Volcanoes
Week 6. October 5 – 7	Volcanoes
	<u>Assignment 2. Suzy Housewife- PP- Applying Scientific Thinking</u>
Week 7. October 12 - 14	Earthquakes
	<u>Quiz 1 – Volcanoes</u>
Week 8. October 19 - 21	Earthquakes
Week 9. October 26 - 28	Earthquakes
Week 10. November 2 - 4	Tsunamis
	<u>Assignment #3- science experiment: PP- Approaches to Scientific Investigations</u>
Week 11. November 9 - 11	Tsunamis

Quiz 2. Earthquakes

Week 12. November 16 - 18

Typhoons

Week 13. November 23 - 25

Typhoons

Week 14. November 30 – Dec 2

Summing Up and Final Quiz

Final Quiz December 2nd

Term paper due December 9th.