

GEOG 390 Natural Hazards

Course Number: GEOG 390
Course Title: Natural Hazards
Section:
Time: Monday, Wednesday, Friday 9:10-10:00 am
Location: HALB 104
Credit Hours: 3

Instructor Details

Instructor: Dr. Zhe Zhang
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Course Description

This course will provide students with a brief overview of the geophysical processes of various natural hazards, as well as social science and geospatial principles and methodologies to address critical questions relating to managing the risks of these natural hazards.

Natural hazards are often more complex than simply being forces of nature. Their impacts are variable based on the vulnerability of people, communities, and the economy. Geospatial and social science play an important role in evaluating alternative mitigation and adaptation strategies. In some cases, this means lessening the physical impacts through measures like flood control projects, while in others it means guarding life and property through self-protection or insurance. This course will provide students with a brief overview of the geophysical processes of various natural hazards, as well as geocomputational principles and methodologies to address critical questions relating to managing the risks of these natural hazards.

Course Prerequisites

[GEOG 203](#) or [GEOL 101](#)

Special Course Designation

None

Course Learning Outcomes

In general, at the end of the class, each student will be able to:

- Understand differences between ‘natural hazard,’ ‘natural disaster,’ and ‘catastrophe’.
- Understand the complexity of disaster events as related to risk, vulnerability, social context and direct and indirect impacts.
- Describe and map the risk of different natural disasters.
- Explain the role of geospatial and social science in understanding, forecasting, predicting, and mitigating natural disasters.
- Analyze catastrophic character of disaster events and how they differed from ordinary hazards.
- Understand physical and social context of disasters, causes of each event, how they can be mitigated or prevented, and differential and cascading impacts.
- Devise mitigation and adaptation strategies that could be implemented to reduce natural hazard impacts.

Textbook and/or Resource Materials

NONE – No textbook is required for this course. Readings will be assigned for the exercises as needed.

Grading Policy

Class consists of a mix of lectures, class exercises, and a group project.

1) Lectures: This course is considered a IN-PERSON FORMAT COURSE. This means that LECTURES will be given for the topics that are related to natural hazards management.

2) Classroom Exercise and Disaster Management Webinars: You will be assigned 8 classroom exercise and discussion sessions that will ask you to read the selected journal articles and present it at the classroom. Six students will form a group to complete the classroom exercise. Each classroom exercise + discussion session is 40 points. Attendance is required on the lectures and classroom exercise sessions. You MUST attend class to 1) get an overview about the assignment and any components that may need to be done in person, and 2) to meet and connect with your team members. If you miss class on one of these days (as listed on the syllabus, you may not make up that exercise unless you have an excused absence.

Classroom presentation must include the following elements: Introduction and motivation of the research, data, methods, results, and discussion. All team members must attend the presentation. Three groups will present the papers (3 journal articles) that they have read during the class. The other groups will prepare at least 2 questions/group in order to collect the full points for each classroom assignment. You can use ArcGIS story map or Power Point to prepare for your presentation.

These assignments will use **ArcGIS Story Maps** to prepare you for your Disaster Project. Students will also have an opportunity to work on the final project during the exercise sessions.

- <https://storymaps.arcgis.com/Links to an external site.>
- <https://storymaps-classic.arcgis.com/en/how-to/Links to an external site.>

I will organize two disaster management webinars where I will invite disaster management professionals to give a presentation. You are required to attend them. Each webinar is 40 points.

3) Homework: After each week, you will develop three quizzes based on the knowledge you learned during that week in the class. Please see an example below:

Hurricane Harvey was a devastating _____ that made landfall on Texas and Louisiana in August 2017.

1. Hurricane (correct answer)
2. Tornado
3. Earthquake

4) Exams: This course consists of two exams. Each exam has ten quizzes selected from students' homework quizzes. You can complete the exam within 90 min (from 9:00 am to 11:59 pm anytime) online during the exam day at home. There will be no class on the day of the exam.

5) Disaster Project: You will be assigned a GROUP mapping project related to a recent disaster that may be completed in groups of 5 people. You will work in groups to create an ArcGIS Story map that explores the physical, geocomputational, and social contexts of a current (not in the last 3 years, but in the past 10 years) natural disaster of their choosing. Projects MUST BE COMPLETED BY THE LISTED DUE DATE ONLINE.

Everyone is required to submit a team evaluation report where you give 100 points to the team member who has done excellent work. Give fewer points that reflect the contribution of their work to the project.

The detailed instructions and grading policy for the project work has been uploaded in "Modules" folder in Canvas.

These assignments DO require **IN-TEXT CITATIONS** of outside references from scientific journal articles, books, articles, etc. for portions of the assignment. You may use APA or MLA citation styles. Please review how to correctly cite information for these exercises at the links below:

- <https://guides.library.unr.edu/mlacitation/in-textcite>Links to an external site.
- <https://apastyle.apa.org/style-grammar-guidelines/citations>Links to an external site.

Your grade in this class is based on the above requirements. Grades are based on a point system, which is further explained below.

Classroom Exercise	8*40=320	pts
Two CyberTraining Webinars	40* 2= 80	pts
Homework	10*10=100	pts
Exam	100*2= 200	pts
Project Work	300	pts
Total	1000	pts

Additional Points

- Attend Webinar and Workshops	60	pts
3*20 points (the date will be announced later)		

Hard Deadline May 5th. You have to submit all your assignments by May 5th.

Letter grades follow these cutoffs:

>=90% : A

80-89% :B

70-79% :C

60-69% :D

<60% :F

Late Work Policy

The deadline for each assignment is published in Canvas.

Late Assignment Policy: Late assignments will receive a 10% score deduction for each day after the original due date, unless you contact the instructor BEFORE THE DUE DATE ONLINE and provide an excused absence/documentated emergency. Documentation is necessary for every case. Excused absences are covered in the TAMU Student Rules (<http://student-rules.tamu.edu>).

The hard deadline for all assignments is May 5th, 2024.

Course Schedule

<u>Week</u>	<u>Day</u>	<u>Dates</u>	<u>Lecture Topic</u>	<u>Homework</u>
1	Wed	17-Jan		
	Fri	19-Jan	Syllabus & Course Expectations	-
	Mon	22-Jan	Form the project groups	
2	Wed	24-Jan	Introduction to Natural Hazards	Homework 1
	Fri	26-Jan	Geocomputation in Natural Hazards Management	
	Mon	29-Jan	Flooding	
3	Wed	31-Jan	ESRI	Homework 2
	Fri	2-Feb	Social Science in disaster management	
	Mon	5-Feb	Flooding Classroom Exercise 2	
4	Wed	7-Feb	Flooding Classroom Discussion 2	Homework 3
	Fri	9-Feb	Project Work Discussion	
	Mon	12-Feb	Volcanoes	
5	Wed	14-Feb	Volcanoes Classroom Exercise 3	Homework 4
	Fri	16-Feb	Volcanoes Classroom Discussion3	
	Mon	19-Feb	Exam Review	
6	Wed	21-Feb	Mid-Exam	
	Fri	23-Feb	Wildfires Lecture	5
7	Mon	26-Feb	Wildfires Classroom Exercise 4	

	Wed	28-Feb	Wildfires Classroom Discussion 4	Homework
	Fri	1-Mar	Hurricanes	6
	Mon	4-Mar	Hurricanes Classroom Exercise 5	Homework
8	Wed	6-Mar	Hurricanes Classroom Discussion 5	7
	Fri	8-Mar	Earthquakes	
9	Mon	11-Mar		
	Wed	13-Mar	Spring Break	No Homework
	Fri	15-Mar		
	Mon	18-Mar	Earthquakes Classroom Exercise 6	
10	Wed	20-Mar	Earthquakes Classroom Discussion 6	Homework 8
	Fri	22-Mar	Tsunamis	
	Mon	25-Mar	Tsunamis Classroom Exercise 7	
11	Wed	27-Mar	Tsunamis Classroom Discussion 7	Homework 9
			Reading Day no class	
	Fri	29-Mar		
			NGS workshop	
	Mon	1-Apr	Climate Change	
12	Wed	3-Apr	Climate Change Classroom Exercise 8	
	Fri	5-Apr	Climate Change Classroom Discussion 8	Homework 10
	Mon	8-Apr	Exam Review	-
13	Wed	10-Apr	Final Project Presentation (group 1-3)	
	Fri	12-Apr	Final Project Presentation (group 4-5)	
	Mon	15-Apr	AAG	
14	Wed	17-Apr		-
	Fri	19-Apr	No Class	
	Mon	22-Apr	AAG No Class	-
15	Wed	24-Apr	Final Presentation (group 6-7)	
	Fri	26-Apr	CyberTraining for Disaster Management	

16	Mon	29-Apr	Impacts of a Changing Environment on Hydrological System
17	Fri	3-May	Final Exam

Optional Course Information Items

This course will use Canvas to manage the course material, communication, and grading.

University Policies

This section outlines the university level policies. The TAMU Faculty Senate established the wording of these policies.

***NOTE:** Faculty members should not change the written statements. A faculty member may add separate paragraphs if additional information is needed.*

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

“The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence” ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. ([See Student Rule 24](#)).

Academic Integrity Statement and Policy

“An Aggie does not lie, cheat or steal, or tolerate those who do.”

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case” ([Section 20.1.2.3, Student Rule 20](#)).

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You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources office on your campus (resources listed below). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

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Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based

discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

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Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

Campus-Specific Policies

The following statements below are optional. Leave as is to include, or delete if preferred. Either way, delete this note.

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. Currently enrolled students wishing to withhold any or all directory information items may do so by going to howdy.tamu.edu and clicking on the "Directory Hold Information" link in the Student Records channel on the MyRecord tab. The complete [FERPA Notice to Students](#) and the student records policy is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees honors and awards received, participation in officially recognized activities and sports, medical residence location and medical residence specialization.

College and Department Policies

College and departmental units may establish their own policies and minimum syllabus requirements. As long as these policies and requirements do not contradict the university level requirements, colleges and departments can add them in this section. ***Please remove this section if not needed.***

Click [here](#) for more information on Texas A&M University's syllabus requirements.