



Carleton
UNIVERSITY

**Department of Earth Sciences
Course Syllabus and Outline
Natural Disasters - EARTH 2415
Fall 2023 – September to December**

LAND ACKNOWLEDGEMENTS

Carleton University acknowledges the location of its campus on the traditional, unceded territories of the Algonquin nation. In doing so, Carleton acknowledges it has a responsibility to the Algonquin people and a responsibility to adhere to Algonquin cultural protocols.

COURSE DESCRIPTION

A natural disaster is a catastrophic event resulting from Earth's natural process. They sometimes lead to the loss of lives, properties, and some irreplaceable priceless assets, and the deformation of the earth's surface. Examples of natural disasters include earthquakes, volcanic eruptions, tsunamis, firestorms, and Tornadoes. Others are floods, storms/firestorms, landslides, dust storms, and extreme weather conditions. These natural disasters are caused by geological, solar, meteorological, and hydrological processes that humans may experience from time to time and place to place.

Seismologists, volcanologists, hydrologists, and meteorologists have observed and studied these events to explain the candidate mechanisms leading to these natural disasters and made attempts to predict future occurrences of some disasters – e.g., floods, wildfires, and hurricanes. However, the predictions of when and where disasters such as earthquakes and volcanic eruptions would occur are not yet accurate. Interestingly, mitigation strategies that include engineering, architecture, communication, and emergency responses can be put in place to reduce the impact of any kind of natural disaster. This course covers the descriptions of the process leading to natural disasters with emphasis on the science and history, the forecast, mitigation, response and economic impacts drawing examples from Canada, United states and other countries.

This course – EARTH2415 will start off with introduction to Earth's structure and plate tectonics and go on to describe earth's internal process, hydrological and meteorological process leading to natural disasters, explain why some countries are more prone to some natural disasters than others.

Professor: Wasiu O Raji, PhD (wasiuraji@cunet.carleton.ca)
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Teaching Assistants:

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Lecture hours: Lecture will hold online synchronously (live lectures) via zoom and asynchronously (no live lectures) on the dates and times shown in table 1. Synchronous lectures are shown in blue while the asynchronous lectures are shown in black. During asynchronous class, students will study lecture materials and watch the videos provided by the professor. Link to synchronous lecture room is on Brightspace.

Student hours/ Office hours: Prof & TAs operate virtual office hours via zoom on Thursdays starting from September 14th, **from 12:00 PM to 2:00 PM** to respond, in real time, to questions from students on lecture contents, assignments, exams, personal, etc. link to the meeting room is on Brightspace.

Email policy: All questions relating to this course should be sent to the course discussion forum, not my/TA's email box, so that everyone can benefit from the responses. The TA and I will respond to questions on '**Discussion**' within 48 hours, except on weekend. The link to the discussion board is on Brightspace page for this course. Responding to individual emails from over 300 students enrolled in this course by the Prof. can be overwhelming, cause delays, and duplication of efforts. Given the workload, I will not respond to emails asking questions about lectures/announcements/deadlines, results, attendance/grades, absence at lectures, missed or upcoming quizzes/exams, etc., **if they are not posted on the 'Discussion board'** except they are very personal and highly confidential. Our office hours holds on **Thursdays from 12 noon to 2 PM** and offers the opportunity for one-on-one discussion with Professor/TAs, and welcomes all questions - personal and academic. The Zoom link to office hours is <https://carleton-ca.zoom.us/j/3248163558> . Thank you for your understanding and cooperation,

COURSE LEARNING OUTCOMES

The course learning outcomes include the following:

Understand the process leading to the different natural disasters,

Know the impacts of natural disasters,

Understand the cause-effect relationship between earth process and natural disasters,

Know the strategies and safety practices that can be used to mitigate the impacts of natural disasters, and

Understand the associated risks of natural disasters on people, communities, and infrastructure.

COURSE DELIVERY:

The course will be delivered online asynchronously (50%) and synchronously (50%). Lectures will hold on Wednesdays for three hours, from 11:30 AM to 14:25 PM via zoom according to the schedule. Link to the zoom lecture room is available in Brightspace. For asynchronous classes, students are expected to study the lecture materials (and watch videos – where applicable) on their own. Lecture materials and videos will be posted on Brightspace ahead of the lectures. Attendance at synchronous lectures is mandatory. Attendance and class participation will be graded. Students should ensure they log in to zoom using their names as their appear on the course list.

IMPORTANT DETAILS

- All important information will be posted on Brightspace. This includes course information, lecture slides, announcements, quizzes, exams, and grades.
- It is the responsibility of the student to check Brightspace and the class forum to stay up to date with the course activities.
- Grading will be based on quizzes, assignments, class participation & attendance, a midterm, and a final exam. The best three of the four quizzes will be used to compute the final exam.
- It is students' responsibility to refer regularly to the course website for lecture topics, quizzes, assignments, and announcements. Students should regularly log on to Brightspace to check for announcements and update. Students are encouraged to subscribe to announcement alerts
- Attendance in lectures is mandatory. Attendance grade will be awarded to students who participated in lectures only. It is required that you email the instructor to advise of absences due to **illness or emergencies within two days** of missed deadline or an exam and provide evidence to support your circumstance. More details will be provided during the lectures.

QUIZZES, ASSIGNMENTS, and EXAMS: See also Table 1 and 2

Quizzes and exams will be conducted online synchronously at the times stipulated in table 2. Each of the exams will comprise MCQ and short essays questions. The Exam will be proctored electronically and all students attempting the exam will be required to be on camera for the entire duration of the exam. Quizzes would be held online/virtual, and assignment will be submitted through Brightspace.

- Each quiz, exam, and assignment will assess your understanding of the course.
- Students are expected to read the lecture material ahead of the lectures and prepare for each class, quiz, and exams. There would be four (4 for 3) quizzes and two (2) exams.
- Each quiz will last a period of about 20 mins minutes and take place during lecture hours as schedule in Table 1.
- The quiz grades/feedback will be available few days later, within the same week.
- Should you experience problems during your Quiz:
 - o Note the time, take a screenshot of the problem showing your computer time, and send an email to the professor immediately.
 - o No accommodation will be made to waive or redo a Quiz unless supporting documentation is provided and /or a complaint is lodge two days before the quiz with supporting documents
- Attendance at mid and final exams is mandatory.
- Both exams will take place at a fixed time, not a time range, outside the lecture period.
 - o No additional time will be given for late arrival to tests, exams, and quiz unless the circumstance is substantiated. Start and finish times are fixed.
- The Midterm Exam will occur as shown in the schedule
- The Final Exam will be scheduled by Exam Services in December and the day could fall outside of lecture hours

TEXTBOOK

The following textbooks are recommended: Textbooks 3, 4 are available in the Uni. Library.

1. Abbott, P.L. and Samson, C. 2015 (4th Edition). Natural Disasters – Canadian Edition. McGraw Hill Ryerson.
2. Abbot Patrick L. Natural Disasters, 12 Edition, Mc Graw Hill
3. Natural Hazards, DeVecchio, Duane E; Keller, Edward A 2016
4. Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes, Keller Edward A DeVecchio, Duane E.

GRADING SCHEME:

Quizzes - 15% (3 of the 4 quizzes, weigh 5% each)

Assignments – 15% (2 assignments)

Attendance and class participation – 5%

Mid terms exam - 30%

Final exam – 33%

Total – 100%

Table 1: LECTURE SCHEDULE

Lectures will hold on Wednesdays from 11:35 – 14:25 starting from September 6th, to December 6th, 2023. Table 1 shows the schedule of lectures for the term. The schedule may be slightly modified and when this happens, students will be notified. Lecture will be delivered online via Zoom and Brightspace.

Table 1: Lecture schedule

S/No	Date	Lecture #	Lecture topic
Wk 1	Sept 3 – 9	Orientation/Welcome	No lecture
Wk 2	Sept 13	Lecture #1	Introduction
		Lecture #2	Disaster and emergency management
Wk3	Sept 20	Lecture #3	Plate tectonic and earthquakes I
		Lecture #4	Plate tectonics and earthquakes II
Wk 4	Sept 27	Lecture #5	Earthquakes, people, and infrastructure
		Lecture #6/ Quiz 1	What happened during an earthquake
Wk 5	Oct 4	Lecture #7	Plate tectonics and Volcanoes
		Lecture #8	Tsunami
Wk 6	Oct 11	Lecture # 9	*Climate change & Firestorm
		Lecture 10/ Quiz 2	*Climate change & Firestorm/review
Wk 7	Oct 18	Midterm exam	Covers lectures 1 -10/ online, 11:30 -13:30
Wk 8	Oct 25	Fall reading week	No lectures
Wk 9	Nov 1	Lecture #11	Mass movement I
		Lecture #12	Mass movement II
Wk 10	Nov 8	Lecture #13	Snow Avalanche
		Lecture #14	Severe weather /Quiz 3
Wk 11	Nov 15	Lecture #15/ Quiz 3	Eruptive style and landform I
		Lecture #16	Eruptive style and landform ii
Wk 12	Nov 22	Lecture #17	Floods
		Lecture #18	Hurricanes
Wk 13	Nov 29	Lecture #19 Lecture #20/	*Geomagnetic and Impact of space objects
Wk 14	Dec 6	exam review/Quiz 3	Final exam review
TBC/ December 10 - 22		Final exam	Covers Lecture 11-20/ online exam

QUIZZ, ASSIGNMENT, AND EXAM SCHEDULES: each quiz will last for about 20 minutes on date stated below. Between 5:00 pm and 7:00 pm. Table 2 is shown below.

S/No	Date	Task	Description of the task
1	Wednesday Sept 27	Quiz 1 at 14:10 -14:30	MCQ Covers lectures 1-6

2	Oct 7 at 11:59 pm	Assignment 1 is due @	Long answers/essay
3	Wednesday Oct 11	Quiz 2 at 14:10 -14:30	MCQ Covers lectures 7-10
4	Oct 18 Wednesday	Mid-term exam	Covers 1-10
5	Wednesday Nov 11	Quiz 3 at 14:10 -14:30	MCQ Covers lectures 11-15
6	Nov 18 at 11:59 pm	Assignment 2 is due	Long answer/essay
7	at 14:10 -14:30Dec 6	Quiz 4 at 14:10 -14:30	MCQ Covers lecture 16 -20
8	Betw Dec 10 & 22	Final exam	Covers lecture 11-20

Missed quizzes, exam, and due dates

Students are to note the date slated for quizzes, exams, and assignments and plan accordingly to ensure they do not miss any quizzes, exams, and due dates for assignments. Make-up quiz or exam will not be approved for any student unless in a case of emergency. In this case, documents on the emergencies will be required to get approval for make-up.

Student Hours/Office Hours: there will be Student Hours (office hours) per week where students can reach the TAs or Professor via zoom to ask questions on the lecture content, assignments, exams, quizzes, due dates, accommodation, and personal questions related to your well being and academic experience. Office hours will be held every Thursdays, from-12:00 noon – 2:00 PM via zoom. Link to the room is available in Brightspace.

Question and answer on discussion board: Prof and TAs will respond to questions on Discussion Board regularly. All questions will get a response within 48 hours. Link to the Discussion Board is available on Brightspace.

ACADEMIC INTEGRITY

It is your responsibility to review Carleton's policy on Academic Integrity - Section 14 of the Calendar and obey them whole heartedly. Ignorance is not an excuse. If you have questions/need clarity on academic integrity, please ask your professors.

<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/acadregsuniv14/>

Plagiarism: The instructor is required to report all incidents (or suspected incidents) of plagiarism to the Dean. **All work handed in must be your own.** Plagiarism and cheating are viewed as being particularly serious and the sanctions imposed are accordingly severe. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy. The Policy is strictly enforced and is binding on all students.

Presenting another person's ideas, arguments, written words, or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the graduate degree. Academic dishonesty in any form will not be tolerated. Students who infringe the Policy may be subject to one of several penalties including: expulsion; suspension from all studies at Carleton; suspension from full-time studies; a refusal of permission to continue or to register in a specific degree program; academic probation; or a grade of Failure in the course.

REQUESTS FOR ACADEMIC ACCOMMODATION

Please review the Carleton's Student Guide to Academic Accommodations at <http://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>, and the websites therein.

Students with Disabilities:

"The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term/classes, and no later than two weeks before the scheduled test or exam requiring accommodation. After requesting accommodation from PMC, please follow up with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam.

Religious Observance: 1. As soon as you receive your course syllabus, identify any potential conflicts between your religious obligations and course requirements.

2. Make a formal written request to your instructor indicating the nature of the religious obligation and suggest possible alternative dates and/or mean of satisfying the academic requirements. Such request should be made during the first two weeks of the term, or as soon as the need for accommodation is known to exist, but in no case later than the second to last week of classes for the term. For detailed information on religious obligations please visit our website at: carleton.ca/equity/accommodation/

Pregnancy or Parental Leave: A. For final exams. Identify and discuss your needs for final examinations with your professors. When an agreement is reached fill out and submit the online Pregnancy Accommodation Final Exam Request Form at: carleton.ca/equity/accommodation. Equity Services will forward the request to Exam Services to coordinate the accommodation. For detailed information on pregnancy and parental leave policies please visit the website at: carleton.ca/equity/accommodation/academic/

Parental Leave: Either parent may request up to three terms of leave, which must be completed within

12 months of the date of birth or custody or request for leave for health-related family responsibilities. For detailed information on pregnancy and parental leave policies please visit the website at: <https://carleton.ca/equity/policies-procedures/>

Equity and PMC Contact information:

- Department of Equity and Inclusive Communities
613-520-5622, 3800 Carleton Technology & Training Centre
equity@carleton.ca, Website: carleton.ca/equity
- Paul Menton Centre for Students with Disabilities
613-520-6608, pmc@carleton.ca
500 University Centre
Website: carleton.ca/pmc

Mental Health: Carleton has a wide range of resources for wellness and mental health. Some of them can be found here <https://wellness.carleton.ca/mental-health/>