General Description
Of the ten deadliest disasters in the past century, six were due to or related to earthquakes; massive flooding and storms caused the remaining four. Over the last century more than 50 million deaths have been caused by natural disasters. What does this mean? Why does this happen and how are agencies working towards preparedness? This course investigates physical aspects of natural hazards that affect people and society. We will focus on the natural systems and processes that cause floods, earthquakes, volcanoes, landslides, hurricanes, tornadoes and other natural disasters. The course includes a discussion of major events in the geologic and historical record as well as future hazard potential and how Geographers are working toward understanding these issues and developing strategies for mitigation and adaptation. We look at the risks humans face in different regions, including local hazards, our contribution to geologic hazards, and how we can minimize and cope with future events. In addition to our classroom discussions and lectures we will evaluate hazards that have developed or may develop in southwestern Ontario. Although the probability of the more typical types of hazards (e.g., earthquakes, volcanic eruptions) is low, there are other types of hazards that need to be taken into consideration with respect to individual and community preparedness in Ontario and other parts of Canada. We will also spend time discussing and analyzing the ways in which risk is assessed and managed by insurance companies and emergency response agencies.

Calendar Description
This course investigates physical aspects of natural hazards that affect people and society and will focus on the natural systems and processes that cause climate variability and change, floods, earthquakes, volcanoes, landslides, hurricanes, tornadoes and other natural disasters. There are no prerequisites, corequisites or restrictions for this course.

Learning Objectives
This course aims to introduce and enhance the learning objectives identified by the University of Guelph and Department of Geography, Environment & Geomatics. Specifically, in this course students will:

- Develop a comprehensive depth and breadth of understanding of the core concepts and principles that dictate earth hazards. Students will evaluate the earth as an integrated system by examining dynamic flows, interactions and exchanges at different spatial and temporal scales.
- Critically and independently recognize, synthesize and evaluate diverse sources of knowledge, arguments and approaches pertinent to exploring elements of geoscientific problems.
• Appreciate and begin to reflect critically on the importance of holistic, integrative human-environment perspectives.
• Investigate complex real-world challenges using appropriate concepts, methods, and tools from the geographical sub-disciplines.
• Recognize and identify the societal relevance of geographical knowledge and apply it to real world human-environment issues.
• Value respectful, responsible, and just community engagement and demonstrate active citizenship when addressing human-environment issues.

Overview of Course Content and Organization
We will have one lecture each week, the content we will explore include the following:

• Plate Tectonics, Earthquakes and Volcanoes
• Tsunamis
• Weathering, Slope Stability and Mass Movements
• Severe Weather: Thunderstorms, Tornadoes and Hurricanes
• Rivers and Flooding
• Climate Change: past, present and future
• Asteroids, Impacts, Extinction Events

Lectures will include in-class activities, multi-media presentations, group discussions and in-class assignments. Each week students will complete an online quiz based on the lecture and assigned readings for that week, students are responsible for preparing and completing these quizzes in the timeframe stipulated. There are two short assignments during the term based on recent or notable hazards. Please refer to the materials related to these assignments for more details and deadlines.

Learning Services for First Year Courses
Although many of you may not be first year students, because this course is designated as a first-year course there are additional resources available to you. Learning resources for first-year students at the Library and Learning Commons. They offer free services to help you succeed in first year courses at the University of Guelph.

These opportunities include:

• meeting with a peer helper to talk about study strategies or your writing assignments
• attending Supported Learning Groups
• getting assistance finding journal articles and books
• registering for academic workshops

For more information please visit the Library website or ask me to direct you to someone at the Library and Learning Commons. Library website → www.lib.uoguelph.ca
Textbook


Any introductory Natural Hazards textbook (CANADIAN edition) written in the last 5-6 years is sufficient – I urge you to find the most cost effective option and make use of the reserve copies in the library. Keller et al., has been used for a number of semesters, there should be used copies available.

Finally, I do NOT RECOMMEND purchasing an access ID or subscription MasteringGeology™, I am satisfied that students can be successful using the textbook as suggested in the lectures/reading schedule. Moreover, I find that sometimes the features associated with MasteringGeology™ focus on themes tangential to the principles and primary concepts we will use in GEOG*1350. However, if you are interested in this tool and/or have found this type of tool useful in the past, please do whatever will help you to be the most successful.

CourseLink Page

There is a course webpage on CourseLink. To access this resource use your central account ID and password. This is the same login ID and password that is used to access your University of Guelph email and WebAdvisor. CourseLink can be accessed from the University’s homepage.

Evaluation (select the scheme that works for you before Test 1)

Scheme A (if you do not select a scheme by Test 1, this is the scheme you will be evaluated on):

The final grade will be assessed from weekly review quizzes completed online (10%), two assignments (15% each, 30% total), and three tests spaced throughout the term (60%). Quizzes and tests are based on information presented and discussed in lectures, assigned readings and assignments. The first test is in week 4, second test is in week 8 and the final test (non-cumulative) is scheduled during the university exam period. In summary:

- Weekly Review: 10%
- Assignments: 30%
- Tests: 60%

Scheme B:

The final grade will be assessed from two assignments (15% each, 30% total), and three tests spaced throughout the term (70%). You will still have access, and are encouraged to complete the weekly review quizzes, but the score on the quizzes will not count toward your final grade, thus the test section of your evaluation is weighted more heavily. Weekly review quizzes and tests are based on information presented and discussed in lectures, assigned readings and assignments. The first test is in week 4, second test is in week 8 and the final test (non-cumulative) is scheduled during the university exam period. In summary:

- Assignments: 30%
- Tests: 70%

Students with a documented conflict for any tests need to see me at least two weeks prior to arrange an alternative time, there is no guarantee that this will be accommodated, but ensuring that you address the issue several weeks in advance will certainly assist the process.
Weekly Review Quizzes – worth 10% in the default evaluation scheme, completed online

The weekly review quizzes are an incredible opportunity for students to review and ‘test’ themselves on the relevant material at a relatively frequent pace. The quizzes in total are worth 10% of the final grade in the class (default scheme). The quizzes are used to incentivize engagement with the course material one more time. So if you skim the readings before class, attend class and take helpful notes along the way, read the assigned readings, review your notes each week that is approximately six points of engagement with the material. Adding the quiz makes it seven points. I think these points of engagement with the material are vital to an in-depth and comprehensive understanding of complex concepts in GEOG*1350. So the quizzes might feel like extra work – and they should – because the whole point was to get you to engage with the material one more time. Furthermore, the quiz questions help me to gauge student comprehension and usually reflect the most important or challenging ideas and concepts covered during that week. Finally – quiz questions are often re-used on the exams – so in case you needed one more reason to pay attention to them, they will likely help you out with the tests.

Assignments – 15% each, 30% total

These assignments are an opportunity for you to demonstrate to us that you understand key concepts. More details about the assignments will be presented at the end of week 1 in class.

Student Responsibilities

It is in your best interest as a student to attend lectures, complete assignments and readings. Late assignments will be penalized at the rate of 25% per day. Students whose assignments are late because of a valid medical reason, family emergency or other reason accepted by me will not be penalized. It is expected that you are respectful of each other, the teaching assistants and the course instructor (i.e., if you wish to talk with your friends, update Facebook, or use your phone, please do so outside of class).

Course Schedule Fall 2019, Lectures and Readings (Keller et al., 2015)*

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topic(s)</th>
<th>Reading and Notes</th>
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<tbody>
<tr>
<td>0-1</td>
<td>Class overview, quizzes, exams, assignments</td>
<td>Chapters 1-3</td>
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<tr>
<td>Sep 6-13</td>
<td>o Hazards and Risk</td>
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<td></td>
<td>o Plate Tectonics and Earth's structure</td>
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<td></td>
<td>o Earthquakes and faults</td>
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<td>o Ground motion and damage control</td>
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<td>2</td>
<td>o Earthquake predictions</td>
<td>Chapters 3-4</td>
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<td></td>
<td>o Haiti Earthquake</td>
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<td></td>
<td>o Sendai Earthquake</td>
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<td></td>
<td>o The next BIG event</td>
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<td></td>
<td>o Tsunamis</td>
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<td></td>
<td>o Alaskan, Indonesian and Sendai tsunamis</td>
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<td>3</td>
<td>o Volcanoes – types, products, forces</td>
<td>Chapters 5</td>
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<td></td>
<td>o Hazards and perceived risks</td>
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<td></td>
<td>o Volcanic environments and case studies</td>
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<td></td>
<td>Time permitting, Test 1 review</td>
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<tr>
<td>4</td>
<td>Monday September 30 - Test 1 – Chapters 1-5, Lectures 1-3, in class</td>
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<tr>
<td>Week</td>
<td>Lecture Topic(s)</td>
<td>Reading</td>
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</tbody>
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| Week 4 cont. | o Mass Wasting  
  o Strength and friction  
  o Types of motion, avalanches – special type | Chapter 6  
  Chapter 7 |
| 5 | o Mass Wasting continued  
  o Subsidence – karst landscapes, sinkholes, clays  
  o Cold regions | Chapters 6-8  
  Assignment 1 due Oct 11 11:59pm - dropbox |
| 6 | o Subsidence continued  
  o Coastal environments and hazards  
  o The water cycle | Chapters 8, 12 |
| 7 | o Fluvial Environments  
  o How rivers work and floodplains  
  o Urban vs Rural watersheds | Chapter 9 |
| | Time permitting – Test 2 review | |
| 8 | **Test 2 - Ch 6-9 & 12, Lectures 4-7, in class, Monday Oct 28**  
  o Weather and Climate (introduction to next 3 lectures)  
  o Atmospheric Processes  
  o Energy & heat transfer, Earth’s energy balance  
  o Atmospheric composition & structure | Ch 10 (10.1-10.4) |
| 9 | o Weather Processes  
  o Fronts and front development  
  o Hazardous Weather  
  o Cyclones, thunderstorms, super cells, tornadoes  
  o Ice Storms  
  o Hurricane Katrina  
  o Wind & dust storms  
  o Wildfires (sub-section of severe weather) | Chapter 10 continued |
| | | Chapters 11, 13  
  **Assignment 2 Due Nov 8 @ 11:59pm** |
| 10 | o Past Climate Variability  
  o Global climate dynamics -> cycles in earth’s climate  
  o Icehouse-Greenhouse cycles  
  o Milankovitch and cycles within the last ~3 mya | Chapter 14 |
| 11 | o Recent Climate Variability – Anthropogenic Changes  
  o Hazards associated with climate change  
  o Minimizing impacts of cc  
  o Atmosphere – review | Chapter 14 cont |
| 12 | o Minimizing impacts of cc  
  o Atmosphere – review Assessing risk – increasing the risk and potentials  
  o Time permitting Test 3 review | Chapter 14 cont |

*The schedule may change or be adjusted depending on our progress

**TEST Dates:**
Test 1 – Wk 4, in-class → Monday Sept 30, 2019 in class  
Test 2 – Wk 8, in-class → Monday Oct 28, 2019 in class  
Test 3 – Thursday December 12, 2:30-4:30, scheduled during the final exam period location tba
E-mail Communication
As per university regulations, all students are required to check their <@uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date
The last date to drop one-semester courses, without academic penalty, is the last day of classes (Friday November 29, 2019). For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

Copies of out-of-class assignments
Keep reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility
The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email SAS@uoguelph.ca or see the Student Accessibility Services website.

Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources
The Academic Calendars are the source of information about the University of Guelph’s procedures, policies and regulations, which apply to undergraduate, graduate and diploma programs.