

GEOL 1410

Natural Disasters and Global Change

Acknowledgements

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The University of Manitoba, Distance and Online Education

Syllabus

Contacting your instructor

For information on contacting your instructor as well as other important information from your instructor see the Instructor Letter in your course website.

Course description

The University of Manitoba *Undergraduate Calendar* describes this course as follows:

GEOL 1410-NAT DISAST GLOBAL CHANGE Discover how and when natural disasters occur, and how to identify and recognize them. Explore the Earth processes that lead to natural disasters and global change. Not to be held with the former GEOL 1360 (007.136).
0.000 TO 3.000 Credit hours

Humans and nearly all aspects of our societies are ultimately dependent upon geology. What we as humans eat and wear, where we live, how we work, and how we move about are all ultimately dependant on geology.

One problem that emerges with this dependence on and living with geology is that there are many geologic situations and natural processes that can be hazardous to humans. Geologic events such as earthquakes, volcanoes, floods or landslides are not inherently problematic but invariably can become hazardous if humans choose to occupy the land being influenced by these processes. This course focuses on natural hazards that can cause disasters and how and why these otherwise normal geologic processes concentrate their energies to adversely affect humans and society.

The modern investigation of natural disasters and catastrophes is a broad subject encompassing virtually every aspect of the traditional topics of Earth science, geology, geophysics, geochemistry, and hydrology, including many associated scientific and engineering subdisciplines.

Course goals

During this term our investigations and discussions of natural disasters will revolve around two major themes:

- the geoscience of natural hazards, and
- hazard prediction and mitigation.

This course has three main goals:

- To present and discuss the role that natural geologic processes play in creating conditions that are detrimental to human activities.
- To assess how best society can mitigate the adverse affects of geologic hazards on local, regional, and global scales.
- To examine the fundamental processes of global climate change (GCC) and the global interconnectedness of the Earth's air, water, rock and life systems as changes occur within and between these components.

Course materials

Required Bookstore

The following required materials are available for purchase from the [University of Manitoba Bookstore](#). Please order your materials immediately, if you have not already done so. See your [Distance and Online Education Student Handbook](#) for instructions on how to order your materials.

- **Textbook:** Keller, E. A., Blodgett, R. H., and Clague, J. J., (2012). *Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes* (2nd Canadian Edition), Pearson-Prentice Hall, Toronto. ISBN-13: 978-0-13-509053-4
 - Approximately 80% of this text will be assigned during the term.

Distance and Online Education (DE) Student Resources

Contacting Distance and Online Education

Information on how to contact Distance and Online Education staff is located in each course website in the “Contact DE” link found under Welcome! Start here.

Distance and Online Education Student Handbook

The [*Distance and Online Education Student Handbook*](#) is located in each course website and on the [Distance and Online Education website](#). You can bookmark the site for easy access at your convenience.

Accessing both the *Handbook* and the *DE Guide* throughout the year provides you with detailed information regarding the management/administrative aspects of this distance education course. The *Handbook* tells you how to access:

- your instructor;
- Distance and Online Education Student Services;
- information on using technology;
- the University of Manitoba Libraries;
- information on ordering your course materials through the University of Manitoba Bookstore; and
- information on accessing your grades and submitting assignments online.

Distance and Online Education Guide

The *Distance and Online Education Guide* is located online on the [Distance and Online Education website](#). It contains important information on programs and courses offered through DE.

Student resources

Links to services for students, including links to the library, library online chat, learning resources, exam schedule, DE website, computer support, and the Virtual Learning Commons are located online in each course website on the course homepage under the “Student Resources.”

Course overview

The course is intended to provide an *overview* of the salient aspects of geologic hazards as they contribute to disasters, some of which are unique to the field, others being shared with allied disciplines such as soil science, engineering geoscience, hydrology, and geochemistry. The ultimate objective of the course is to foster your analytical and critical thinking skills. We will have plenty of facts to learn, but we will always want to go beyond just the bare facts to the societal/environmental implications and interpretations. It must also be emphasized that many of the hazards we will systematically discuss as *separate* processes are actually strongly interconnected.

Learning activities

This online course will utilize the following learning activities:

- Textbook readings
- Online notes that supplement the textbook material
- Web links
- Review questions
- Written projects

Evaluation and grading

Grading scale

Letter grade	Percentage range	Description
A+	90 – 100	Exceptional
A	80 – 89	Excellent
B+	75 – 79	Very good
B	70 – 74	Good
C+	65 – 69	Satisfactory
C	60 – 64	Adequate
D	50 – 59	Marginal
F	49 and below	Failure

Please check the academic calendar for the last date for voluntary withdrawal from the course without academic penalty. I am instructed by ROASS policy to advise you to read the academic regulations and policies in the current years University Undergraduate Calendar. In particular, be aware of the policies regarding academic dishonesty, including plagiarism and cheating, examination impersonation, and attendance at class and debarment. In the case of individual assignments and term projects, specific instructions concerning due dates are provided at the start of the term. If you have any questions, ask.

Distribution of marks

Evaluation	Percentage
2 Written Projects @20%	40%
Final examination	<u>60%</u>
Total	100%

Late assignments and term projects will NOT be accepted.

Note: All final grades are subject to departmental review.

Plagiarism, cheating, and examination impersonation

You should acquaint yourself with the University's policy on plagiarism, cheating, and examination impersonation as detailed in the General Academic Regulations and Policy section of the University of Manitoba *Undergraduate Calendar*. Note: These policies are also located in your *Distance and Online Education Student Handbook* or you may refer to Student Affairs at <http://www.umanitoba.ca/student>.

Assignments

Term Projects:

GEOL 1410 Natural Disasters and Global Change is designed to fulfill the University's written English" (W) requirement through the submission and evaluation of **two** significant written assignments or term projects. Each of these projects is worth 20% of your total mark; each will be evaluated and graded on the following criteria:

(i) Quality of writing and presentation (35%). This includes clarity of sentences and paragraphs, organization and coherence of ideas, structuring, style, grammar, punctuation and use of English.

(ii) Scientific content and information (30%).

(iii) References and use of references (35%). This includes the scholarly level and soundness of the references, how effective the references are used and cited in the paper, and adherence of correct format for citation and referencing.

It is expected that your paper is original. If a paper, or any part of a paper, is identified as not being original, and/or not done by the student, the paper may receive a zero. Anything that is not your own thoughts/concepts must be cited explicitly in the text. Every source you use must be cited within the text. The University of Manitoba has an exceptional Library system with a large number of quality peer-reviewed scientific journals available both in-house and on-line. Use of non-refereed, non-reviewed sources (including most 'encyclopedias') is generally not acceptable in scientific writing at the university level. In particular, avoid use of non-refereed on-line sources, such as ask.com, about.com, Wikipedia, etc.

You should start working on these projects soon; do not wait until the last minute to start the projects because they both demand a considerable amount of research time. If you have not done a university-level term paper or a term project write-up, it is recommended you contact the Writing Tutor Program of the Learning Assistance Centre (www.umanitoba.ca/u1/ac).

Your paper will need to be submitted digitally through the Angel facility. Do not wait until the last day to submit your paper because the system periodically goes down or there may be technical issues which might result in your paper not being submitted on time. **Late papers are not accepted and will receive a mark of zero.** Required style/format guidelines are posted on Angel; please consult these and follow the guidelines closely, particularly with respect to referencing and reference citation format.

BOTH assignments must be completed, and a minimum grade of 19.5 out of 40 on the assignments achieved, along with a passing grade for the final examination, to achieve a passing grade for the course. The mark on the first assignment will constitute written feed-back prior to the voluntary withdrawal date for the course.

Project ONE (20%)

Objectives and Format

Table 2.2 in your textbook provides a list of over twenty "major" earthquakes in Canada and United States. The objectives of this project are to research one of these earthquake events/hazards/disasters and to compose a reasonably complete written review/summary of the topic. Your research should be based mainly on existing library and peer-reviewed scientific publications and resources, although interlibrary resources may be necessary for aspects of some of the topics. Do not rely mainly on non-refereed, non-scientific materials such as newspapers, popular magazines, encyclopedias or on-line sources like Wikipedia or ask.com. It is not appropriate to base your paper mainly on textbook material, although sometimes texts are an excellent 'starting' point for your research. Your review/summary should be well organized, well referenced with a complete list of source materials, and about 1500-2000 words (6-8 pages typed, double spaced). Take care to proofread your paper in order to correct any faulty grammar and punctuation.

Your description and discussion will vary depending on the particular event you choose, but will likely include the following aspects (not necessarily in this order): introduction to the event and location; the geological and, in particular, plate tectonic setting; prior seismic activity at or near the site; nature of any precursor activities/events; predominant types and severity of hazards or potential hazards associated with the event on both local and regional levels; main primary and secondary impacts on local communities at the time of the earthquake; how does this particular earthquake compare in size and effects with other seismic events in the region; description of pre- and post-event monitoring efforts and plans to mitigate hazards both at the time of the event and subsequent to the event; nature and frequency of subsequent seismic activity in the area; lessons learned from the event/disaster; what was done immediately and in the longer-term to lessen the impact of seismic activity in the area and how effective were these measures in terms of saving lives and/or property; what else could have been done to minimize effects; summary.

If you use figures, they should all have captions and numbers, and be referred to in the text. In a relatively short 6-8 page paper like this, it is not necessary to include a table of contents, however, use of headings is strongly recommended to help with your organization. Complete references (using the required format) should appear at the end of the paper. Please note, a references cited list is not a bibliography!

Due Date: Monday, October 17; late projects will not be accepted.

Project TWO (20%)

Objectives and Format

The objectives of this second term project are to watch a “popular” Hollywood-style feature movie that deals with the topic of natural disasters/hazards and write a review/summary of the scientific merit (or lack thereof) of the movie. The movies from which you can choose are listed below, or feel free to find you own that is not on the list. However, if you do choose a movie that is not on the list, please check with me BEFORE you start your project.

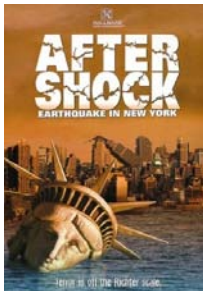
Your review/summary should be well organized and devoted mainly to the critical discussion of the quality of the science, the validity of presentation of the hazard/disaster, and the feasibility of the repercussions illustrated/suggested in the movie. You may also want to comment on any special effects. Your project write-up should be about 1500-2000 words (6-8 pages typed, double spaced). Take care to proofread your paper in order to correct any faulty grammar, punctuation and organization.

The following points may help you compose an organized and complete review (not necessarily in this order and do not necessarily limit your comments to just these points):

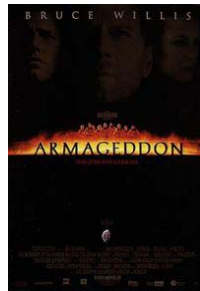
- Note the geological significance, interesting geological features on location, a geological topic or subplots you notice in the film.
- Note any geological (or in the case of Krakatoa, East of Java, geographical) or scientific errors you observe, or which have been observed by others (always give proper credit for information, ideas and concepts of others)
- There are movie official pages on the web which often provide details about filming locations and situations.
- Be sure to cite all sources of information, including internet sources.
- Do not limit your research to just web page sources; for example, if some geological or hazard aspect presented in the movie seems erroneous or unlikely, support your contention with references to published scientific literature.
- Obviously, do not copy any part of previous reviews.

Due Date: on or before the last day of the regular term. Late projects will not be accepted.

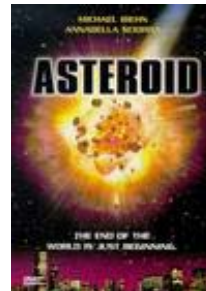
Movies (or choose one not on this list but be sure to check with your instructor before starting the project).



**Aftershock:
Earthquake in New
York (1999)**



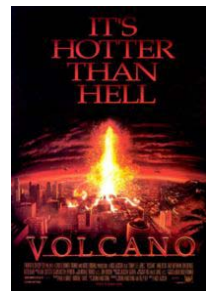
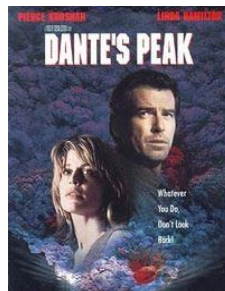
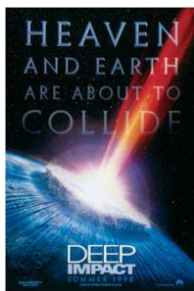
Armageddon (1998)



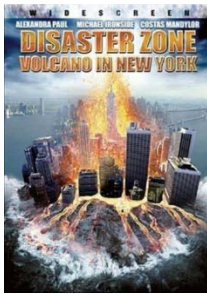
Asteroid (1997)



**Crack in the World
(1965)**



Deep Impact (1998)



Disaster Zone: Volcano in New York

Dante's Peak (1997)



Killer Flood: The Day the Dam Broke (2003)

Volcano (1997)

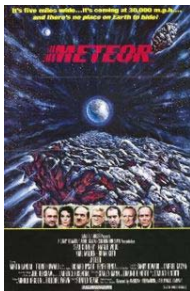


When Time Ran Out (1980)

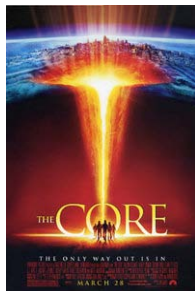
Tidal Wave: No Escape (1997)



Krakatoa, E of Java (1969)



Meteor (1979)



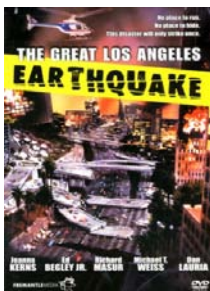
The Core (2003)



10.5 Apocalypse (2006)



The Day After Tomorrow (2004)



The Great Los Angeles Earthquake (1990)

Final Examination

Note: If you live outside Winnipeg please submit the “Application Form for Examination at a Location Other than the University of Manitoba Campus” immediately. The form may be submitted online. The online form is in the [Forms Section](#) of the Distance and Online Education website. Additional information is found in the *Distance and Online Education Student Handbook*. The links to the Distance and Online Education website and the *Handbook* are found in your course website.

At the end of the course an invigilated final examination will be written which will be worth 60% of your final mark. This examination will be designed to test not only your grasp of the theoretical concepts of hazard geoscience, but also the more practical critical evaluation and problem-solving abilities you have acquired. Normally, the final examination is weighted approximately equally between material covered in the course notes and that covered in the assigned textbook readings.