

GEOL 111 - Natural Hazards

Instructor: Dr Lizz Ultee (eultee@middlebury.edu, BiHall 415)
Office Hours: Tu 1:30-2:30 and Th 4:15-5:15, or by appointment
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Course description:

Despite increasing technological sophistication, modern civilization remains vulnerable to natural hazards such as earthquakes, volcanic eruptions, tsunamis, flooding, landslides, extraterrestrial impacts, and other events. In this course we will consider the geologic mechanisms behind these hazards, the societal implications of these hazards, and approaches to reducing risk. Case studies will be combined with exploration of fundamental geologic concepts to provide students a foundation for understanding risk exposure and evaluating approaches to hazard management.

Objectives:

At the conclusion of this course, you will be able to

- Explain the geologic mechanisms of selected natural hazards;
- Describe how natural and social factors co-produce risk;
- Critically interpret popular media coverage of disasters; and
- Identify practical measures to reduce societal impacts of natural hazards.

Our work together will help you develop skills including

- Quantitative reasoning,
- Synthesizing information from multiple perspectives, and
- Self-directed learning.

Resources:

We will draw on two key resources:

- John McPhee, *The Control of Nature*. A paperback that should be available for <\$20 from campus bookstore or Vermont Book Shop. Used is totally fine and encouraged.
- Hyndman & Hyndman, *Natural Hazards and Disasters*. Several copies should be on course reserve at the Science Library. Providing textbooks is new for the library, so we'll try this out and pivot to online resources if needed.

Course preparation assigned outside of these two books will be shared on Canvas.

Quizzes:

We will have weekly quizzes starting the third week of semester. Each quiz is planned to take 10 minutes and will include questions covering

- (1) the reading assigned for the week of the quiz; and
- (2) information discussed in the previous week's classes.

The quizzes also include a component of out-of-class preparation: For each quiz, you may prepare and bring along one 8.5x11" sheet of notes. The notes must be your own work, cannot be shared, and (if typed) may not use smaller than 8pt font.

I am not able to offer make-up quizzes, so please plan not to miss them. Your single lowest quiz grade (which could be a 0, if there was a week you missed a quiz) will be dropped.

Natural Hazards Journal:

I encourage you to keep an eye on the news for stories relevant to class material. The Natural Hazards Journal will be your summary of at least 5 natural disasters that occur over the course of the semester. Each entry should describe what happened, how it happened, and what the consequences were, as well as a reflection on what you learned by studying the event (see instructions on Canvas). Your first journal entry will be due for feedback at the end of the second week of class.

Assessment and grading:

We will use frequent check-ins, not all of which will be graded, to gauge progress and evolving needs. Example assessments could include

- Short in-class writing assignments (“minute papers”),
- Surveys,
- Group exercises and brief presentations,
- Online annotation of readings, and
- Reflective writing

Your course mark will be assigned according to the suggested weighting and ranges listed below. **You will set and self-assess goals for your participation in class.**

60% Weekly quizzes (8 highest of 9)	Course mark	Numerical range
20% Natural hazards journal	A	93-100
20% Participation (self-directed)	A-	90-92
	B+	87-89
	B	83-86
	B-	80-82
	C+	77-79
	C	73-76
	C-	68-72
	D	55-67
	F	<50

Course schedule:

Below is a course schedule, subject to adjustments according to our class needs and wants. Most course readings have an annotation assignment on Canvas. It is essential to do the assigned preparation, as we will spend class time building on these resources.

Week	Topic	Reading	Due
2/14-2/18	Course intro. Defining hazard and risk	Hyndman & Hyndman Ch 1	Participation plan
2/21-2/25	Plate tectonics and the dynamic Earth	"What is a tectonic plate?" (Planet Geo)	First journal entry
2/28-3/4	Earthquakes	Abbott Ch 3	Quiz 1
3/7-3/11	Tsunamis	Hyndman & Hyndman Ch 5	Quiz 2
3/14-3/18	Volcanoes	McPhee, "Cooling the Lava"	Quiz 3
3/21-3/25	SPRING BREAK		
3/28-4/1	Landslides and debris flows	McPhee, "Los Angeles Against the Mountains".	Quiz 4 + Participation check-in
4/4-4/8	River floods	McPhee, "Atchafalaya"	Quiz 5
4/11-4/15	Intro to weather hazards - convective storms	Hyndman & Hyndman Ch 10	Quiz 6
4/18-4/22	Avalanches	NYT "Snow Fall"	Quiz 7
4/25-4/29	Hurricanes and coastal hazards	Hyndman & Hyndman Ch 16	Quiz 8
5/2-5/6	Wildfires	Hyndman & Hyndman Ch 17	Quiz 9 + Natural Hazards Journal
5/9-5/13	Global climate change	Hyndman & Hyndman Ch 12	Participation log

Policies & resources

What to bring to class

A notebook, pen, and laptop. In-class activities will often ask you to write things down. Some activities will need a computer. You are welcome to take notes on paper or on a device, but please resist the temptation of social media/games/other device rabbit holes. Those distractions can disrupt the learning environment not only for you, but for others around you.

How to participate in class

There are lots of ways to be an active participant in class. Here are some ideas for participation, according to what best suits your style:

- Sharing your ideas and questions with the class
- Making space for others to contribute to class discussions
- Posting thoughtful questions and comments in our online spaces
- Responding promptly if I email you about class business
- Working together with classmates on graded assignments
- Attending office hours
- Visiting campus resources such as the Writing Center or STEM peer tutoring

You will be responsible for setting and assessing your own goals for class participation. Keep track of these goals; you will report them to me in the last week of class.

Honor Code

I am required to remind you that this course is subject to the Undergraduate Honor System (go.middlebury.edu/honorcode). Plagiarism, cheating, duplication of work, and falsifying data are all prohibited under the Code. I do encourage you to work together on in-class tasks and studying; simply ensure that you each write up your own version of anything you hand in unless otherwise specified, and make note of anyone you worked with. I also encourage you to consult the course materials and the scientific literature to inform your work; simply ensure you cite as required by the Code. I tend to use APA style citation, but I'm not too picky. If you are confused about a point relating to the Honor Code, including any troubles with attribution, please come and talk to me.

Late work

There are very few deadlines in this class. Quizzes are held weekly in class and cannot be made up. For other assignments (class participation checkpoints and Natural Hazards Journal) I would like to have everyone's work as close to the deadline as possible so that I can return it to you with feedback as fast as possible. Plus, when you hand things in on time, you can move on to handling other important things in your life.

I will offer a budget of two free late days, total, to be taken as needed. Once late days are used up, there will be a penalty of 10% per day. These will be administrated automatically in Canvas. This allows me to focus my attention on you and your learning rather than on logistics. Please get in touch if you know you'll need to use up lots of late days.

Extra credit

In the interest of an equitable grading approach for everyone in class, I don't give individual opportunities for extra credit. There is the opportunity for extra credit by doing additional reporting for the Natural Hazards Journal—see Canvas.

Sometimes, really cool and unexpected events that relate directly to our course will come up in the middle of the semester. In that case, I might entice you to participate in those events by announcing an extra credit opportunity to the whole class. In general, if you are worried about your course mark, please get in touch with me to make a plan.

Attendance

It is my goal to provide you with an excellent learning environment in class. I hope you will attend every class in order to benefit from that environment. Please contact me if you know you will be missing more than two class sessions. If you miss several sessions and I don't hear from you, I will contact you so we can make a plan together.

Although I am anticipating some disruption to our class due to COVID, please note that in general I will not be able to offer a synchronous Zoom option on days when class is held in person. Please plan to be in touch with your classmates and TAs to catch up on anything you miss during class periods when you can't attend due to COVID.

Communication expectations

Cultivating a healthy work-life balance helps me keep doing work I love for the long term. I encourage you to consciously create your best schedule as well. Part of that, for me, means not checking email outside of College business hours. That means that it might take up to 36 hours (or more on the weekend) to get a response to an email you send me. If you really need a faster response, the best thing to do is to stop by my office (MBH 415). You can also try sending an email with [URGENT] in the subject line. The best time to discuss course questions is during office hours or a scheduled appointment.

Extenuating circumstances

Life happens. There are lots of circumstances that can make it hard to learn: food insecurity, health concerns, and family crises, to name just a few. If you are struggling, please do reach out to me, your student life Dean, or to another trusted advisor on campus so that we can connect you with resources to support you. I will do what I can to ensure you have what you need and can focus on learning.

Mental health services

I encourage you to seek help anytime you need it. The office of Health and Wellness can provide free and confidential mental health evaluations, urgent care, group therapy, medication management, and referrals to off-campus providers. This year, Middlebury Counseling is prioritizing as-needed services, in many cases offering appointments on the same day they're requested. I am not a qualified mental health provider, but I can direct you to additional resources on campus as needed.

Accommodations and adjustments

I am committed to fostering an inclusive and encouraging classroom environment. Please come to me any time to discuss things I could start, stop, or continue doing to promote inclusion. In addition, if you have a Letter of Accommodation, please contact me as early in the semester as possible to ensure that we can implement the necessary accommodations in a timely fashion. For eligible students without current Letters of Accommodation, assistance is available through the Disability Resource Center (DRC). Please contact ADA Coordinators Jodi Litchfield and Peter Ploegman of the DRC at ada@middlebury.edu for more information. All discussions will remain confidential.

IT services and open software

Wherever possible, I will point you to open software alternatives to paid software. I view this as a support for your career: it ensures that you can continue working with familiar software no matter where you go after graduation. This said, the College does have a site license for several paid software packages you might like to use for this course or others: for example, MATLAB and the Adobe Creative Cloud. Definitely check in with ITS (go.middlebury.edu/software) or visit a campus computer lab before you consider buying software yourself.

Library helpdesk

Libraries are amazing. Librarians are information wizards. Did you know that every department at the College has a specialist librarian to help researchers find information they need? The College libraries have a number of tools you may like to explore, but for general inquiries, you can navigate to the library homepage (go.middlebury.edu/library) and click “Chat with a Librarian”. During business hours, someone will respond to you via text chat; outside business hours, your message will be sent to an inbox and handled when the librarians return. No need to even leave the house!