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EAS 3803: Natural Hazards

THE GEORGIA INSTITUTE OF TECHNOLOGY

January 6 - May 1, 2026

Lecture: Tues., Thurs. 12:30 - 1:45 pm in 202 Skiles

Instructors: Andrew Newman

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Online material: Canvas at <https://gatech.instructure.com/courses/????> and
<https://avnewman.github.io/teaching/NatHaz>

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General

This class is developed to give students insight into the physical underpinnings of the major natural geologic and climate-related hazards, as well as strategies to mitigate damage to life, the environment and infrastructure in order to maximize long-term sustainability. We will synthesize our understanding of many components of Earth sciences (including geology, oceanography, and climatology) to understand the varied contributions that collectively create risk to populations. We will examine regional susceptibilities to hazards, including event severity and frequency of occurrence, and the impact that economics, regulations, and monitoring may have on the community.

Student Learning Outcomes: Students will develop an integrated understanding of Earth hazards and their impact to populations:

- Geologic Hazards including earthquakes, volcanism, landslides, tsunamis.
- Atmospheric Hazards including hurricanes, flooding, climate change.
- Synthesis of Earth System interactions as they pertain to direct and cascading hazards.
- Data analysis and statistics based on real-world data
- Scientific Communication through written and oral communication

Required Text: Keller, E. A., & D. E. DeVecchio, Natural Hazards, 5th Ed., Taylor & Francis Group, ISBN: 9781315164298, 2019.

Office Hours: I am eager to connect with you all to maximize the success of Georgia Tech. For brief communications, this can often be handled directly after class, in the room or in my office. In addition, you can use Canvas messages or email for quick, short-answer questions, particularly about logistics. However, if you have run into a conceptual block, or would like to discuss a topic in more detail, this is best done by appointment, and I will work with you to find a time to meet either in-person or online. I do not hold regular “office hours” as these rarely work for most students. Instead, I will try to remain flexible to respond to your needs during normal work hours (8a - 5p).

Required Electronics: Students must have a computer with reliable high-bandwidth internet, a functional webcam, speakers, and microphone (headphones are fine). A quiet and minimally disruptive environment for online activities and study are important.

Online Resources and Communication: Canvas is the primary organizational resource for information about the class. Lectures are planned to be live and in-person. If there is a significant health concern due to COVID or similar, we will transition to Zoom meetings. I will always inform of any such changes through your Canvas announcements. *Being at class and on-time is essential for performing best in this course.* If you need to email me outside of Canvas, please identify [EAS 2600] at the beginning of the subject line.

Health: For any face-to-face contact masks will be optional, unless otherwise instructed. Presentation slides for class are planned to be made available following each class. *These are considered supplementary for study, but are not a replacement for class attendance.*

Students with Disabilities: If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <https://disabilityservices.gatech.edu>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Attendance: You are expected to attend the class in-person. If health-measures require, we will offer a remote, likely synchronous option. I will not be taking direct attendance, but if you miss a quiz without a university-approved reason it will count as one of your dropped scores. In any serious situation that precludes your participation in class (death in the family, serious illness, etc.) you should contact the Dean of Students as they are there to help you in these cases (<https://www.deanofstudents.gatech.edu/>).

Evaluation

Course Grade: Your grades will be based on your performance through **Participation (40%)**, **Quizzes (40 %)**, and a **Final Project (20%)**.

- Letter Grade: $A \geq 90\% > B \geq 80\% > C \geq 70\% > D \geq 60\% > F$
- Satisfactory/Unsatisfactory: $S \geq 70\% > U$

Participation (40%): Students will be expected to come to class and participate in activities and lectures throughout the semester. Grading will come from both verbal and on-line discussions on individual topics throughout the semester (30%), and participation and questions during the final project presentations (10%).

Quizzes (40%): We will have 30-minute quizzes at the start of class every third Thursday. These quizzes will solely cover the material since the prior quiz, with the exception of the final quiz during the final exam period which cover material throughout the semester. Students will be able to drop their lowest quiz grade, including the final.

Final Project (20%): This will include both a **Paper (15%)** and a brief **Presentation (5%)**.

- **Paper:** All students will review and present on a topic of your that focuses on a specific case study surrounding natural hazards. The project will include, a statement of the hazard and its critical assessment of it's risk, as well as mechanisms being considered that will help to mitigate disaster. The report will use relevant research and review articles from scientific literature including peer-reviewed literature, and governmental reports (not *National Geographic* or *Scientific American*, but journals like

Science, Nature, Journal of Geophysical Research, Earth and Planetary Science Letters, USGS Open File Reports, etc...). In order to receive full credit for the project you must:

- Submit a six-to-eight page single-spaced 12-point font (Helvetica, Times, or PT Sans), manuscript.
- Must include a synthesize no less than three papers on the chosen hazard.
- Must include a clear discussion of at least one mechanism for mitigating a future disaster, including potential drawbacks from such a mitigation strategy.
- Must include a clear discussion of your own thoughts on approaches to mitigate hazards.
- A complete bibliographic reference (not included in above page limit)
- Figures are optional, but will require clear captions and referencing (not included in above page limit)
- Manuscript must be of your own work and not the manifestations of Artificial Intelligence.

- **Presentation:** All students will present a brief "lightning talk" covering their topic for their paper. More details on the presentation will come in the second half of the semester.

Academic Honesty

General: It is expected that all students are aware of their individual responsibilities under the Georgia Tech Academic Honor Code, which will be strictly adhered to in this class. The complete text of the Honor Code may be found at: <https://honor.gatech.edu>.

Student-Faculty Expectations

At Georgia Tech we believe it is important to strive for an environment of mutual respect, acknowledgment, and responsibility between faculty and students. Please see the *Student Handbook Code of Conduct* for some basic expectation that we should have of each other. Ultimately, we should respect each others time, hard work, and quest for knowledge. We should strive to build an environment for cordial and effective interaction.

Pathway to success:

Students should do best in this course if they keep up with reading, actively participate in lecture meetings, turn in assignments on time, and rapidly seek help if they begin to fall behind, or are having difficulty with a topic. Note that chapters are listed with each lecture and that I will not explicitly tell you to read beforehand. When prepping for quizzes, it is wisest to focus on content that was discussed in lecture rather than material only covered in the book. Finally, I try to focus the course on understanding processes rather than memorizing jargon. However, a certain amount of jargon is inevitable and I will try to highlight (verbally or otherwise) when it's a term that I expect you to know.

Lectures

Week	Chapter	Topic
1	Ch 1-2	Hazards overview and Tectonics
2-3*	Ch 3	Earthquakes
4	Ch 5	Volcanism
5	Ch 14	Impactors
6*	Ch 4	Tsunamis
7	Ch 7	Mass Wasting
8	Ch 6,8	Flooding and Subsidence
9*	Ch 9	Severe Weather
10-11	Ch 10	Hurricanes <i>Spring Break</i>
12*	Ch 11	Coastal Change
13	Ch 13	Wild Fires
14	Ch 12	Climate Change and Hazards
15*-6		<i>Final Presentations</i>
(TBD: 4/30-5/7)	Ch 1-14	Final Quiz

Topics and timing are subject to change during the semester.

*30 minute quizzes about every 3 weeks on Thursday.

Campus Resources for Students

In your time at Georgia Tech, you may need support. Below you will find some resources to support you both as a student and as a person. Some websites change with time (faster than syllabi!). As such, links to all of these resources should be findable on the left-hand side of the Canvas webpage.

Academic support

- Center for Academic Success [https://success.gatech.edu:](https://success.gatech.edu)
 - 1-to-1 tutoring <https://success.gatech.edu/1-1-tutoring>
 - Peer-Led Undergraduate Study (PLUS) <https://success.gatech.edu/tutoring/plus>
 - Academic coaching <https://success.gatech.edu/coaching>
- Drop-in tutoring for many 1000 level courses: *Residence Life's Learning Assistance Program:* <https://housing.gatech.edu/learning-assistance-program>
- Group study sessions and tutoring programs: <https://omed.gatech.edu/programs/academic-support>
- Individualized help with writing and multimedia projects: *Communication Center* (<https://www.communicationcenter.gatech.edu>)
- Academic advisors for your major: <https://advising.gatech.edu/>

Personal Support at Georgia Tech Resources

- The Office of the Dean of Students: <https://studentlife.gatech.edu/content/services>; 404-894-6367; Smithgall Student Services Building 2nd floor: *You also may request assistance at https://gatech-advocate.symplicity.com/care_report/*
- Counseling Center: <https://counseling.gatech.edu>; 404-894-2575; Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
 - Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.
- Students' Temporary Assistance and Resources (STAR): <https://studentlife.gatech.edu/content/need-help>: *Can assist with interview clothing, food, and housing needs.*
- Stamps Health Services: <https://health.gatech.edu>; 404-894-1420: *Primary care, pharmacy, women's health, psychiatry, immunization, allergy, health, nutrition*
- Belonging: <https://belonging.gatech.edu/studentsupport>; 404-385-2679
- Veteran's Resource Center: <https://veterans.gatech.edu/>; 404-385-2067
- Georgia Tech Police: <https://police.gatech.edu/>; 404-894-2500