

# SIO 170- Introduction to Volcanology

MWF 9:00-9:50 (Remote)

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Welcome to the wonderful and spectacular world of volcanoes! I am thrilled to be able to offer you this experience, and I very much hope that it is an outstanding experience for everyone. The class will introduce you to the science of volcanology, including fundamental principles and processes of volcanic eruptions. I hope to give you a better understanding of what volcanologists do and why volcanology is an important scientific discipline from a societal standpoint. Please let me know if you have questions or concerns and remember that I am here to help at all times.

## **Learning Outcomes:**

Students will be able to:

- List and classify different volcanic morphologies.
- Distinguish between the various types of volcanic activity.
- Explain the relationship between magma genesis, plate tectonics, and volcanism and use this to explain volcanic activity.
- Appraise volcanic hazards in the context of their threat to local communities and the public.
- Analyze past volcanic events and hypothesize about future hazards.

## **Class Organization and Grading:**

This class will include weekly lectures that will take place on Zoom during the regularly assigned class periods. Note that everything will be recorded and posted to Canvas. You are highly encouraged to participate synchronously, but nothing will require your specific synchronous attendance.

I will hold synchronous Zoom lectures on Mondays and Wednesdays (also the first meeting on Friday in Week "0"). Fridays will be reserved for independent work and reading. Assignments will be due every Sunday by 8PM (Pacific Time) on Canvas. Each week will include required readings in *Volcanoes* in addition to quizzes, discussion posts, and assignments on Canvas.

Because the class is remote everything will be open-note, open-book, including the mid-term and final exams.

Please be sure to read the assigned chapters, either attend the synchronous lectures (or review the recordings) and keep up with the assigned work each week. No late assignments will be accepted without prior approval or a documented excuse. Please communicate directly with me via email if you're having difficulties. Sooner is much better than later.

Your grade is based on the following:

- Midterm exam (on Canvas): 20%
- Final exam (on Canvas): 25%
- Canvas quizzes (weekly, based on readings and lectures): 20%
- Discussion posts and homework assignments: 20%
- Volcano report: 15%

### ***Textbooks and Readings***

The class text is *Volcanoes* 2<sup>nd</sup> edition by Francis and Oppenheimer. It is required. You will need to read the assigned chapters that are keyed to the topics we will be discussing in class. There are weekly Canvas quizzes based on the reading and lectures, and the exams will include material from the text, so please acquire a copy as soon as possible (used or new is fine). Unfortunately, there is not an official digital version of the text available.

## **SIO 170 Schedule**

**Note:** This syllabus is an outline of proposed events. It is subject to change; however, never without notification, and never to advance the due dates of assignments.

<b><u>Date</u></b>	<b><u>Lecture Topic</u></b>	<b><u>Chapter in <i>Volcanoes</i> 2<sup>nd</sup> ed.</u></b>
9-24	Introduction	1, 2
9-27	Four classic eruptions	3
9-29	Tectonics and volcanic structures	2, 13
10-4	Magma and volcanic rocks	4
10-6	Magma and volcanic rocks	4
10-11	Styles of eruption: eruptive classification	5
10-13	Styles of eruption: eruptive classification	5
10-18	Lava flows and associated occurrences	6
10-20	Lava flows and associated occurrences	6
10-25	Introduction to pyroclastic density currents	7
10-27	<b>MIDTERM EXAM (details to follow)</b>	
11-1	Pyroclastic eruptions and pyroclastic density currents	7-10
11-3	Lahars and mudflows	12
11-8	“Supervolcanoes” and calderas	11
11-10	Volcanic hazards and monitoring techniques	17
11-15	Volcanic hazards and monitoring techniques	17
11-17	Volcanic risk and society; Volcanoes and Climate	16, 18
11-22	Case studies of famous eruptions (St. Helens)	N/A
11-24	Case studies of famous eruptions (Hawai’i)	N/A
11-29	Case studies of famous eruptions (TBA)	N/A
12-1	Case studies of famous eruptions (TBA)	N/A

**Final Exam: Wednesday, December 8, 8-11am (on Canvas, details will be provided)**