

# **SIO 45 Volcanoes**

## **MWF 10:00-10:50 Center 214**

**Instructor:** Geoffrey Cook

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**Office Hours:** M 11-12 (Galbraith 366); Tu 12-1 (Vaughan 303- SIO) and by appointment

Hello! Welcome to the thrilling world of volcanology! This class is designed to give students from a diverse array of backgrounds a general understanding of earth science and the earth system using volcanoes as a teaching tool. You need not have a background in geology to enjoy the class, and during the quarter you will learn a lot about Earth materials and Earth processes in addition to how volcanoes work. Regardless of your background, I believe you will find the class both interesting and informative. I am here to help you further your education, so please do not be inhibited to visit office hours, seek help/guidance, or discuss any concerns or issues you may have. I always encourage questions and discussion in class and am happy to re-address or clarify concepts. I want this to be a positive and useful learning experience for everyone!

### ***Learning Outcomes:***

*Students will be able to:*

- Discuss fundamental geologic principles and concepts including geologic time, plate tectonics, and the rock cycle.
- Categorize Earth materials and the processes associated with their formation.
- Compare volcanic eruptions and associated products.
- Explain why volcanoes erupt and predict where volcanic eruptions are likely to occur.
- Examine the impact volcanoes have on modern society and recognize the influence geologic processes in general have on humanity.

### ***Class Organization and Grade Breakdown:***

Midterm exam: 25%

Final exam: 35%

Activities: including participation, quizzes and assignments: 40%

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

The textbook is *Volcanoes* 2<sup>nd</sup> edition by Oppenheimer and Francis. Chapters from the book will be assigned in class. Please be sure to complete the assigned readings as you will need them to participate in class; you will also find the class more enjoyable with an introduction to the background materials.

***Absences and Missed Work:***

In the case of legitimate conflicts, notification is required at least one week prior to the regularly scheduled examination. In the case of other types of emergencies or eventualities (sickness, etc.) notification is appreciated as soon as possible and must be verified by a third party. All excuses must be in writing.

***Classroom Conduct:***

Disruptions during lecture are not appreciated. Disruptive behavior including talking, excessive noise, poor behavior towards other students or instructors/TAs, arriving late/leaving early, reading newspapers in class, inappropriate language/comments in lecture or on-line, or ringing cell phones may result in you being asked to leave the class. It is to your benefit to arrive on time because most announcements and assignments occur at the beginning of lecture.

## **SIO 45 Schedule- Winter 2019**

**General 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.

**Date Lecture Topic**

|      |                                                                            |
|------|----------------------------------------------------------------------------|
| 1-7  | Welcome and introduction to volcanology                                    |
| 1-9  | What is a volcano? How are they defined? Why do volcanoes erupt?           |
| 1-11 | Introduction to geology: rocks, minerals, tectonics and geologic processes |
| 1-14 | Volcano taxonomy: types of volcanoes (structures)                          |
| 1-16 | Volcano taxonomy: types of volcanoes (structures)                          |
| 1-18 | Volcano taxonomy: eruptive activity                                        |
| 1-21 | <b>MLK Day (NO CLASS)</b>                                                  |
| 1-23 | Volcano taxonomy: eruptive activity                                        |
| 1-25 | Products of volcanic eruptions: mafic volcanoes                            |
| 1-28 | Products of volcanic eruptions: intermediate to felsic volcanoes           |
| 1-30 | Products of volcanic eruptions: intermediate to felsic volcanoes           |
| 2-1  | Supervolcanoes (Calderas)                                                  |
| 2-4  | The history of volcano study                                               |
| 2-6  | <b>MIDTERM EXAM</b>                                                        |
| 2-8  | Volcanic hazards                                                           |

- 2-11 Volcanic hazards
- 2-13 Volcanic hazards and society: a look at some deadly historical eruptions
- 2-15 Volcano monitoring: can we predict eruptions?
  
- 2-18 **President's Day (NO CLASS)**
- 2-20 Volcano monitoring: can we predict eruptions?
- 2-22 Analogue experiments in volcanology
  
- 2-25 Case studies: Mt. St. Helens (Washington, U.S.A.)
- 2-27 Case studies: Kilauea (Hawai'i, U.S.A.)
- 3-1 Case studies: Mt. Pinatubo (Philippines)
  
- 3-4 Case studies: Mt. Vesuvius and the A.D. 79 eruption
- 3-6 Case studies: Andean volcanoes
- 3-8 Case studies: Mt. Pelee (1902)
  
- 3-11 Case studies: Yellowstone
- 3-13 Case studies: Krakatau (1883 A.D.), Toba and Tambora (Indonesia)
- 3-15 Volcanoes and their influence on climate

**Final Exam: Friday, 3/22/19, 8-11 AM (Center Hall 214)**