

# 2021 EARTH 300

## Processes and impacts of erupting volcanoes



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## *Syllabus/Course Contents*

**Fall 2021**

**Bruce Houghton: phone (808)220-9273**

Times: T,R, 10:30-11:45 pm

[bhought@soest.hawaii.edu](mailto:bhought@soest.hawaii.edu)

3 credits

Place: POST 708

Office Hours: Tuesday 9:00 –10:00 am

## Learning Objectives:

- Introduce the fundamental physical processes & concepts of volcanology
- Illustrate the impacts of volcanoes on communities
- Develop scientific research, problem-solving, and critical thinking skills

**Learning objectives**

1. Processes & concepts.....

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1. Introduce the fundamental physical processes & concepts of volcanology

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1. Processes & concepts

2. Illustrate the impacts of volcanoes on communities

3. Develop scientific research, problem-solving, and critical thinking skills

## Building blocks

ERTH300 is built around a framework of physical and social science.

This course spans the range of physical approaches to eruption processes and the sociology of volcanic crises. It has a strong emphasis on characterizing eruption products of a range of time and length scales. In particular, we will (i) chart the 2018 eruption of Kilauea and (ii) 'adopt' an ongoing eruption.

**Building blocks**

- **PHYSICAL MEASUREMENTS:** introduction to process
- **PROPERTIES OF MULTIPHASE FLUIDS:** underlying causes
- **BEHAVIOR OF PEOPLE:** effects & role of society

## Course design and content:

The course will involve lectures, including analogue laboratory demonstration, and student participation in giving a presentation. Modules are: the rheology and transport of magma; models for intensity and style of explosive eruptions; transport and emplacement of lava flows; origins and characteristics of pyroclasts and pyroclastic deposits; integrated monitoring of active volcanoes, evaluation and impacts of volcanic hazards and volcanic crises.

**COURSE DESIGN**

**MODULES**

- fluid dynamics: magma
- lava effusion
- explosive eruptions
- eruption styles
- volcanoes + society

**FORMAT**

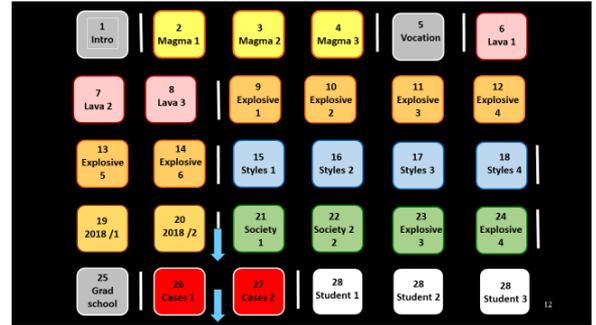
- 30 classes
- 1 videos/labs
- 1 project

The figure shows the division of the 30 classes into 11 modules of uneven length.

**Course characteristics**

One research project linked to volcanic crisis management and eruption response.

Five homework assignments, and numerous on-line quizzes.



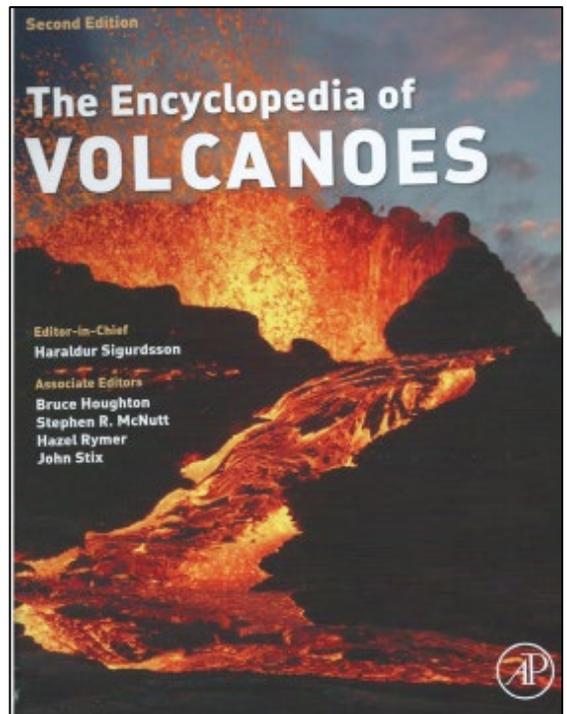
**‘Recommended’ Reading:**

Encyclopaedia of Volcanoes. Sigurdsson, H.; Houghton, B.F.; McNutt, S.; Rhymer, H.; Stix, J. (eds). (2015) Academic Press, San Diego.

We will use the text more as a **supplementary reference** than as a guide for the course; we will not spend much class time regurgitating the information in the text; specific chapters or part-chapters will be assigned, not necessarily in the order in the book. I will make the volume available to you as a pdf.

**Prerequisites:**

100 level geology and basic sciences (math or phys or chem), 200/300 level mineralogy/petrology/earth materials, *or* permission of instructor.



**Evaluation:**

- No extra credit
- No curving grades
- 90%, B> 80%, C> 70%

• project	25
• final exam	10
• tests & quizzes	25
• homework	30
• attendance	10
• <b>TOTAL</b>	<b>100</b>

## Other class requirements

- Use of e-mail and the world-wide-web: As a student at UH, you are entitled to an e-mail account. We will use e-mail via Laulima as an auxiliary means of communicating with each other outside class time. We will also be using WWW resources for our projects and homework.
- Assignments turned in on time: Assignments must be turned in at the beginning of class on the designated day. **Unjustified late assignments will receive one grade-step lower.** The only exceptions will be pre-arranged absences or verified illness.
- Attendance: Because we will be doing tests in every class, on-line attendance will be mandatory for this class. If you know you will miss a class because of scheduled travel or another reason, **please let me know in advance.** There will be no make-up tests except by prior arrangements with me.

The University of Hawai'i is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you. Staff can also direct you to resources that are in the community. Here are some of your options:

**As members of the University faculty, your instructors are required to immediately report any incident of potential sex discrimination or gender-based violence to the campus Title IX Coordinator.** Although the Title IX Coordinator and your instructors cannot guarantee confidentiality, you will still have options about how your case will be handled. Our goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

If you wish to remain ANONYMOUS, speak with someone CONFIDENTIALLY, or would like to receive information and support in a CONFIDENTIAL setting, use the **confidential resources available here**: <http://www.manoa.hawaii.edu/titleix/resources.html#confidential>

If you wish to directly REPORT an incident of sex discrimination or gender-based violence including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence or stalking as well as receive information and support, contact: Dee Uwono, Title IX Coordinator (808) 956-2299 [t9uhm@hawaii.edu](mailto:t9uhm@hawaii.edu).

Disability Access: If you have a disability and related access needs the Department will make every effort to assist and support you. For confidential services students are encouraged to contact the Office for Students with Disabilities (known as "Kokua") located on the ground floor (Room 013) of the Queen Lili'uokalani Center for Student Services: KOKUA Program; 2600 Campus Road; Honolulu, Hawaii 96822 Voice: 956-7511; Email: [kokua@hawaii.edu](mailto:kokua@hawaii.edu); URL: <http://www.hawaii.edu/kokua>