

EASC 5101 Advanced Topics in Geophysics

Spring 2023, Volcanoes: Formation, Unrest, and Eruption (3 credits)

Mon 17:30 - 18:15, Wed 15:30 - 17:15 (SC331)

Course summary: Volcanic eruptions can have devastating economic and social consequences but are also the fundamental force that builds the majority of our planet's surface. Volcanic eruptions and emissions can also affect atmospheric and climate conditions. Many volcanic eruptions have precursory signals and there have been cases of successful evacuation issued, though many have also erupted without any forewarning. This course will explore the various techniques used to study volcanoes' underlying structure as well as their precursory and eruptive activity. Volcano science is fundamentally a multi-disciplinary field so the course will try to embody this spirit.

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Office Hours: right after each class or by appointment

Recommended Readings:

Volcanic Eruptions and Their Repose, Unrest, Precursors, and Timing (free PDF download: <https://www.nap.edu/catalog/24650/volcanic-eruptions-and-their-repose-unrest-precursors-and-timing>)

Course Grade:

- Weekly quizzes (25%)
- Class participation (10%)
- Presentations (30%)
- Final project (35%)

Tentative Course Structure (*indicates student-led discussions)

Each week will be devoted to a theme. For each theme, we will have one structured lecture covering the fundamental background. The other class session will then be student-led where we will discuss journal papers on the topic.

Jan 9, 11	Introduction
Jan 16, 18*	Magma storage
Jan 23, 25	No class (Lunar New Year)
Jan 30, Feb 1*	Magma movement
Feb 6, 8*	Eruption precursors (seismic)
Feb 13, 15*	Eruption precursors (geodesy + remote sensing)

Feb 20, 22*	Eruption precursors (geochemistry)
Feb 27, Mar 1*	Eruption sizes and styles
Mar 6, 8	No class (reading week)
Mar 13, 15*	Volcanic hazards and risks
Mar 20, 22*	Environmental impacts of eruptions
Mar 27, 29*	How volcanoes respond to external forcing
Apr 3, 12*	Large igneous provinces
Apr 5	No class (Ching Ming Festival)
Apr 10	No class (Easter)
Apr 17, 19*	Submarine volcanism

Final paper due May 5th 2023

Academic Honesty and Plagiarism

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at <http://www.cuhk.edu.hk/policy/academichonesty/>.

With each assignment, students will be required to submit a signed declaration that they are aware of these policies, regulations, guidelines and procedures. For group projects, all students of the same group should be asked to sign the declaration.

For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide, the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment. Assignments without the receipt will not be graded by teachers. Only the final version of the assignment should be submitted via VeriGuide.
