GG466: Planetary Geology – Volcanism on Mars

The goal of this course is to provide a high-level undergraduate review of the volcanology of the planet Mars. Hands-on experience with geologic mapping of selected landscapes, analysis of digital data sets, and presentations by guest lectures from scientists working on some of the special topics and/or past missions will be included.

Spring 2018: Lectures Tuesday and Thursday, 10:30 a.m. – 11:45 a.m., POST 544

Instructor: Pete Mouginis-Mark, Hawaii Institute Geophysics and Planetology POST 504A, 956-6490, pmm@higp.hawaii.edu

Office hours by appointment

Text: No book required. We will use multiple published papers to gain an understanding of the current state of the science

Prerequisites: GG105, ASTRO 150, ASTRO 281, GG300, or permission of instructor

Content
This course spans the range of volcanic studies of Mars, probably the most similar planet to Earth in the Solar System when it comes to the diversity of volcanic landforms. We will cover the distribution and style of volcanic activity as a function of age, compare the main constructs and lava flow types to comparable features on Earth, and investigate the role of volcano/ground-ice interactions. Remote sensing and laboratory topics will include what we can learn from analysis of the SNC meteorites, where these rocks may come from, and what the Mars rovers (Spirit and Curiosity) have discovered. Spectroscopic and topographic analysis of regions of Mars believed to characterize early (Noachian) volcanism will also be included.

Course Characteristics
The course will involve lectures, several in-class/homework mapping exercises, and student summaries of journal articles. Three homework assignments comprising planetary mapping exercises (10% of total grade each), oral presentations of at least two journal articles per student will be given to the rest of the class (10% grade each), and one final exam (20% grade). In class participation is important (30% grade); for example, as appropriate, we will also bring in guest speakers who have mission experience with past space missions to Mars, conduct research into relevant aspects of volcanism (i.e., numerical modeling, analysis of the SNC meteorites, and spectroscopic analysis) and the whole class is expected to interact with these historical guests. Collectively, we will also provide a scientific evaluation of a few (2 or 3) popular science fiction movies which purport to show the geology of Mars!
Other Class Requirements

Assignments: Assignments (mapping exercises and paper reviews) must be turned in at the beginning of class or presented in class, on the designated day. Unjustified late assignment will receive one grade-step lower. The only exceptions will be pre-arranged absences or verified illness.

In-class participation: All students will be expected to review one or more of the journal articles prior to the relevant class in order to actively participate in the ensuing discussions. Students who consistently do not participate in these discussions will be assigned a final grade one-step lower than course.

Attendance: Because we will be doing a lot of mapping work during class, attendance will be mandatory for this course. If you know you will miss a day 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.

Student Conduct and Academic Integrity: University guidelines for acceptable student conduct are very specific and will be strictly followed. Please read the guidelines (http://www.catalog.hawaii.edu/about-uh/campus-policies1.htm). Cheating of any form will not be tolerated, nor will blind copying of intellectual material (text) from resources such as books, journals or the Internet.

The Geology and Geophysics Department and Hawaii Institute Geophysics and Planetology will make every effort to assist those with disability and related access needs. For confidential services, please contact the Office for Students with Disabilities (known as “Kokua”) located in the Queen Lili‘uokalani Center for Student Services (Room 013): kokua@hawaii.edu or www.hawaii.edu/kokua.

G&G Student Learning Objectives (SLOs) met by this course:

SLO 3: Students taking this class will learn how to apply scientific methods, such as geologic mapping, spectral analysis, and radar imaging to solve problems in planetary science.

SLO 5: Students will learn how to evaluate stratigraphic relationships on a planet other than Earth to explain complex geologic phenomena in different planetary environments, including investigating role of gravity and atmospheric pressure.

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.