GEO 358K
Volcanology
Fall 2013

Course Syllabus

Instructor:
James Gardner gardner@mail.utexas.edu
JGB 4.108
Office hours: MWF 1-2 PM or by appointment

Course Overview: We will study eruptive processes and products of volcanoes, using methods and concepts from mineralogy, petrology, fluid dynamics, depositional processes, geomorphology, stratigraphy, structural geology, field mapping, economic geology, remote sensing, geochemical monitoring, and seismology. We will examine the economic aspects of volcanism, the prediction and reduction of volcanic hazards, and challenges faced by geologists in communicating with the public, decision-makers, and the media. Lectures for the course will be TTh 2-3:30 PM in JGB 2.310.

Textbook: Two books be will be primary sources for readings: Hans-Ulrich Schmincke, *Volcanism*, Springer-Verlag, 2004, ISBN 3-540-43650-2; Sigurdsson et al., *Encyclopedia of Volcanoes*, Academic Press. Both will be placed on reserve in the Geology Library. Other readings will aslo be assigned, and placed on reserve.

Prerequisites: GEO 426P, or upper division standing in geological sciences for those in a degree program that does not require GEO 426P.

Laboratory Information: M 10-11 (#27725), or W 1–2 (#27724), EPS 4.104
Lab exercises will be case studies of active and ancient volcanoes and their lithologic and economic products, using samples and petrographic sections, topographic and geologic maps, stratigraphic sections, ground-based and aerial photos, videos, and orbital images.

Teaching Assistant:
Kenneth Befus kenny.befus@gmail.com
JGB 5.316
Office hours: M 11AM-12PM, Th 1-2PM, or by appointment

Grades: Your course grade will be based on the combined results of the lecture and laboratory portions of your class in the approximate proportions: 2 class exams (40%), one final exam (35%), and laboratory score (25%).

Class exams: There will be two full-period class examinations (closed book and notes) during the course, which are listed on the class schedule. We will also announce these exams at least one week in advance. No books or class notes will be permitted. Attendance to these exams is required, and a missed exam will be counted as a zero, unless a written doctor's excuse is provided. If an acceptable excuse is provided, a make-up exam will be given. Anyone caught cheating on the exams will receive a zero.

Final exam: There will be an examination during the Final Exam time allotted for the course (see syllabus). This exam will focus on the final third of the course, but will also be comprehensive. No books or class notes will be permitted. Attendance to these exams is required, and a missed exam will be counted as a zero, unless a written doctor's excuse is provided. If an acceptable excuse is provided, a make-up exam will be given. Anyone caught cheating on the exams will receive a zero.

Laboratory Score: This portion of your grade is based on your weekly laboratory exercises and a lab exam. *The laboratory is a required part of the course, and completion of all exercises is required to pass the course*.

Final grades will involve the plus/minus system

Lecture Protocol: The use of laptops is allowed only to take notes (that use requires approval of instructors).

Academic Integrity: No form of academic dishonesty will be tolerated. Information on this issue can be found at: http://deanofstudents.utexas.edu/sjs/acint_student.php

University Honor Code: "The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community."

Special Needs: The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. To determine if you qualify, please contact the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259 (link above). After your needs are certified, the instructors will work with you to make appropriate arrangements. Special needs requests must be submitted in writing at least a week prior to the affected event, e.g. a test or assignment.

Course Content and Syllabus

LECTURE SCHEDULE (TTH 2-3:30 PM)			LABORATORY SCHEDULE	
Aug.	29	Class Introduction	28	*no lab*
Sep.	3	Why volcanoes are where they are	2/4	*no lab*
	5	What is a volcano?		
	10	Magmatic Properties	9/11	Petrography of magmas
	12	Volatiles and bubbles		
	17	Magma ascent rates	16/18	Density/Viscosity of magma
	19	Conduit Flow and degassing		
	24	Two-phase conduit flow	23/25	Textures of volcanic rocks
	26	Magma-water interactions		
Oct.	1	Sizes and frequencies of eruptions	30/2	CONFLOW modeling
	3	**Class Exam #1**		
	8	Lava flows and domes	7/9	ERUPT modeling
	10	Buoyant versus collapsing plumes		
	15	Pyroclastic deposits	14/16	lava flows
	17	Pyroclastic fall deposits		
	22	Pyroclastic flow deposits	21/23	Tephra deposits
	24	Caldera Eruptions		
	29	**Class Exam #2**	28/30	Volumes of eruptions
	31	***FEMA Module 1+2***		
Nov.	5	***FEMA Module 3***	4/6	IAVCEI video on hazards
	7	***FEMA Module 4***		
	12	***FEMA Module 5***	11/13	IAVCEI video on risks
	14	***FEMA Module 6***		
	19	***FEMA Module 7***	18/20	TBD
	21	***FEMA Module 7+8***		
	26	no class	25/27	*no lab*
	28	Thanksgiving Holiday		
Dec	3	Climatic Impacts	2/4	**Lab Exam**
	5	Graduate Student Presentations		