



Course ISNS 3359 501 Earthquakes & Volcanoes
Professor Dr. Ignacio Pujana
Term Spring 2007- 01-08-07 to 04-23-07
Meetings MW 5:30- 6:45 PM, GR 2.530

Professor's Contact Information

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Office Hours M-W 10:00- 11:00 AM
Other Information UTD originated e-mails are the only ones I will read and reply.

General Course Information

Pre-requisites, Co-requisites, & other restrictions None

Course Description

This course provides a broad overview of the science behind earthquakes and volcanoes, new insights they provide about the architecture, processes, and evolution of the earth, and their impact on humankind and other organisms. The plate tectonics model provides the central framework in which the many aspects of earthquakes and volcanoes are described.

Learning Outcomes

- Explain the basic divisions of the earth, their compositions, and their role in plate tectonics.
- Recognize the types of plate boundaries and explain their relationship to crustal movement and mountain building.
- Know the basics of crustal deformation and recognize geologic faults and structures.
- Develop an understanding of the geology of earthquakes and volcanoes, with an emphasis on plate tectonic theory.
- Discuss earthquake generation, measurement and prediction.
- Describe types of volcanoes, lava viscosity, composition and their relation to plate tectonics and volcano explosivity.
- Become familiar with the terminology used to describe earthquakes and volcanoes
- Identify and understand the following classes of volcanoes: hot spot volcanoes, subduction zone volcanoes, island arc volcanoes, and mid-ocean ridge volcanoes.
- Differentiate between the two different types of magmas - basaltic and granitic - and the relationship between each of them and their associated types of volcanoes.
- Appreciate the relationship between human activity and geologic natural disasters with an historic perspective.
- Understand the constructive and beneficial results of volcanoes.
- Explore the subject of extra-terrestrial volcanism and Impacts.

Required Texts & Materials

Natural Disasters by Patrick Abbott (2006, 5th edition, though you can also get the older 4th edition, 2004). Published by McGraw Hill.

Suggested Texts,

Test materials will be taken both from the textbook (see discussion in syllabus

Readings, & Materials below), handouts, and lectures. Tests will include ~50 multiple choice, fill in the blank, T/F, sketch/diagram, or short answer questions. A pre-test review will take place during the class meeting prior to the test.

Assignments & Academic Calendar

(Book readings*) & assignments

(30 class meetings, including 25 lectures & 3 tests)

Room GR 2.530

1 Jan. 8 (Monday) **Lecture i**, Course Introduction

Part I. Quakes & Plates

2	Jan. 10	L1. Overview of Natural disasters (ch. 1) Matter, Earth, sources of energy (ch. 2)	
3	Jan. 15	MLK University Closed	
4	Jan. 17	L2. Plate Tectonics	(3: 50-75) Journal handout
5	Jan. 22	L3. Faults & Seismic Waves	(4: 78-91)
6	Jan. 24	L4. Seismograms, Locating EQ, EQ Magnitude, Intensity, & Recurrence	(4: 92-105)
7	Jan. 29	L5. Seismology; First Motions, Man-made seismicity; Tsunami	(4: 106-113)
8	Jan. 31	L6. Modern EQ – Sumatra, Dec 2004	assign paper
9	Feb. 5	L7. Historic EQ I. Lisbon 1755, SF 1906, AK 1964	(78-79, 123-125, 116-117)
10	Feb. 7	L8. Historic EQ II. Loma Prieta 1989, Northridge 1994	(142-3, 157-161)
11	Feb. 12	L9. Historic EQ III. Kobe 1995, Izmit 1999; Bam 2003	(135-136, 70-71, 4-5)
		paper topic sign up due	
12	Feb. 14	L10. Historic EQ IV. New Madrid 1811-1812	(6) journal I due
13	Feb. 19	Exam I: Plate Tectonics & Earthquakes	

Part II. Volcanoes & Plates

14	Feb. 21	L11. Magma, Lava, & Plate Tectonics	(ch 7)
15	Feb. 26	L12. Continental Volcano Architecture	(7)
16	March 28	L13. Eruptions: Products & Types, Explosivity Scales	(7)
11	March 5	Spring Break	
17	March 6	Spring Break	
18	March 12	L14. Calderas, the really big ones	(7)
19	March 14	L15. Submarine Lavas, Hot Spots, Flood Basalts	(7)
20	March 19	L16. Historic Eruptions I. Vesuvius 79, Tambora 1815, Mt. Pelee 1902	(8)
21	March 21	L17. Historic Eruptions II. Krakatau 1883, Pinatubo 1991, Unzen 1991	(8)
22	March 26	L18. Historic Eruptions III. Mt. St. Helens 1980, Popo 2000, Lengai	(8) Journal II due
23	March 28	Exam II: Plate Tectonics & Volcanoes	

Part III. Synthesis & Relationships

24	April 2	L19. Extraterrestrial Volcanism & Impacts-Out of this world	(16)
25	April 4	L20. Seafloor volcanism and EQ; sources of life and metals?	paper due
26	April 9	L21. Volcanoes, Climate, & Extinctions	(303-306, 437-442)
27	April 11	L22. Volcano Benefits: Energy, Diamonds & Gold	
28	April 16	L23. Importance of Volcanism and Seismicity-Risk	(1)
30	April 18	Exam III: Comprehensive, but emphasizing Part III	

Course Policies

You can keep track of your grades by checking the course WebCT page (link available on the UTD homepage). The final grade is based on the following percentile divisions A+: 97.1-100; A: 93.1-97; A-: 90.1-93; B+: 87.1-90; B: 83.1-87; B-: 80.1-83; C+: 77.1-80; C: 73.1-77; C-: 70.1-73, D=60.1-70, F<60. The final grade will be based on a complex distribution; the shape of the curve is subject to the instructor's discretion, incorporating individual graded assignments, test grades, and class participation. Short pop quizzes will be given in 5 random class meetings and will serve as extra credit opportunities.

Grading (credit) Criteria

	Total	600	(100%)
		points)	
	3 tests, 100 points each	300	(50%)
	Feb & Mar "Journals" (75 pts each)	150	(25%)
Grading components	1 original paper	100	(17%)
	class participation	50	(8%)
	Extra Credit 5 pop quizzes, 10 points each	50	(potential+8%)

Make-up Exams Tests will be taken only during the scheduled in-class period, unless the instructor agrees to reschedule an individual's test as the result of a prior agreement, or a doctor's excuse certifies the student was too ill to attend class the day of the examination. If you have health problems, or extenuating circumstances, please contact the instructor as soon as possible so arrangements can be made.

Extra Credit Late Work

Attendance and class participation may count as much as 8 % of your grade.
none

Special Assignments

Journals: Two Journals (I & II) will be due by the end of class on 14 Feb07, & 28Mar. 07. Journals will deal with descriptions of 1 current earthquake or volcano event per week over a 4 week period (including sketch maps and cross sections describing the plate tectonic framework), following the assigned format (see 18 Jan06 handout).

Paper assignment: An original paper on a unique topic is due late in the term. The paper (concise, ~1 page long in outline form) can be on a variety of particular earthquake or volcano events (excluding those listed on the syllabus-everyone must sign up for a topic by 12Feb07 to eliminate the possibility of duplication). Paper details, expectations, topics, sources, etc. will be provided when assigned on 31 Jan. 07.

Class Attendance Classroom Citizenship Field Trip Policies

Highly Recommended, attendance and class participation may count as much as 8 % of your grade.

According with UTD guidelines

No Field trip

Student Conduct and Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part I, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and

regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Academic Integrity

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent").

Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grades

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)

Disability Services

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as

possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

**Off-Campus
Instruction and
Course Activities**

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities.

Information regarding these rules and regulations may be found at http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean.

These descriptions and timelines are subject to change at the discretion of the Professor.