

Geology 468K – Geophysics for Geological Sciences Majors

Spring 2010

Syllabus

Lectures: Monday 11 am to 1 pm. Wednesday 11 am to 12 pm; JGB 3.120

Laboratory: Tuesday 9–11 am, Thursday 8–10 am, or Thursday 10am–12pm; JGB 3.204

Instructor: Kyle Spikes

E-mail: kyle.spikes@jsg.utexas.edu

Office: JGB 4.220D

Phone: 471-7674

Office Hours: 9–11 am, Monday; 1-3 Tuesday pm, and by appointment

Teaching Assistant: Isaac Smith

E-mail: ibsmith34@gmail.com

Office: JGB 4.220A

Phone: 471-3853

Office Hours: 1–2 pm, Tuesday and Thursday

University of Texas 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.

Course Description: A survey of seismic, magnetic, gravitational, and other geophysical tools and their application to exploration and global-scale problems. The course consists of three lecture hours and two laboratory hours a week for one semester. It is normally offered in the spring semester only. It may not be counted toward the Bachelor of Science in Geological Sciences, Option II . Prerequisites are Mathematics 408D and either Physics 303L and 103N or 316 and 116L, with a grade of at least C in each.

Assignments, Assessment, and Evaluation: Most weeks a homework problem set will be assigned in the laboratory section and in the lecture. These assignments, their issue dates, and their due dates will be posted on Blackboard and mentioned in class or lab. Each assignment will be due at the beginning of the laboratory or lecture period on the day that it is due. For each day an assignment is late, the grade for that assignment will be dropped 10%, down to a minimum of 50%. Short quizzes will be given at the discretion of the instructor. These quizzes cannot be retaken or made up at a later time. Two in-class midterm exams and a final exam will be given. Midterm exams may be made up at the discretion of the instructor if the student can provide valid and substantiated reasons for the absence.

Midterm Exam 1 Date: March 1st , in class.

Midterm Exam 2 Date: Monday, April 12th , in class.

Final exam date: Consult the final examination schedule.

No plus/minuses will be used to determine the final grade. e-Gradebook and/or My Grades on Blackboard will be used to disseminate grades.

Grade Percentage Basis

Homework and laboratory assignments: 45%

Midterm exams: 30%

Final: 20%

Quizzes: 5%

Attendance and Classroom policies: Because most of the information of the course will be provided in the lectures, it is critical that you attend in order to understand the concepts and ideas important for this course. Laboratory sections are mandatory. If you must miss one, it is your responsibility to arrange, with the teaching assistant to attend one of the other sections covering that material. This arrangement must be made prior to the absence.

Materials: Required textbook. *Looking into the Earth, An introduction to Geological Geophysics*, by Mussett and Khan, from which where readings will be assigned. Powerpoint presentations presented in lecture will be posted on Blackboard the day before the lecture. Laboratory materials will be given out at the discretion of the teaching assistant.

Use of E-Mail for Official Correspondence to Students

E-mail is recognized as an official mode of university correspondence; therefore, you are responsible for reading your e-mail for university and course-related information and announcements. You are responsible to keep the university informed about changes to your e-mail address. You should check your e-mail regularly and frequently—I recommend daily, but at minimum twice a week—to stay current with university-related communications, some of which may be time-critical. You can find UT Austin’s policies and instructions for updating your e-mail address at

<http://www.utexas.edu/its/policies/emailnotify.php>

Documented Disability Statement

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or **<http://www.utexas.edu/diversity/ddce/ssd>**

Religious Holy Days

By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, I will give you an opportunity to complete the missed work within a reasonable time after the absence.

Behavior Concerns Advice Line (BCAL)

If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual’s behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health

Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit <http://www.utexas.edu/safety/bcal>

Course Outline

Topics: Listed below are the topics for the course. Although they must be separated to make this list, some will be mixed together and will come up in several contexts.

- A) Earth model concepts
- B) Seismic waves
 - a. Seismometry
 - b. Elastic waves
 - c. Seismogram inversion and tomography
 - d. Free Oscillations
 - e. Whole Earth Structure
- C) Earthquakes
 - a. Seismicity
 - b. Focal mechanisms
 - c. Seismotectonics
 - d. Seismic hazards and risk
 - e. Risk mitigation
- D) Controlled source field methods
 - a. Seismic refraction
 - b. Travel time curves
 - c. Seismic reflection
- E) Exploration seismology
 - a. Rocks and Velocity
 - b. Data processing
 - c. Seismic interpretation
- F) Gravity
 - a. Earth rotation and shape
 - b. Tides
- G) Geomagnetism
 - a. Magnetic fields
 - b. Magnetic surveying
- H) Electrical and Electromagnetic methods
 - a. Controlled source electromagnetic
 - b. Electrical surveys
 - c. Ground penetrating radar
- I) Heatflow
 - a. Temperature
 - b. Convection

Important Dates: Spring 2010

Last day of the official add/drop period: Friday, January 22nd

Last day to drop a class without possible academic penalty: Monday, February 15th

Final exams: May 12–15 and 17–18

Resources for Learning & Life at UT Austin. The University of Texas has numerous resources for students to provide assistance and support for your learning.

The UT Learning Center: <http://www.utexas.edu/student/utlc/>

Undergraduate Writing Center: <http://uwc.utexas.edu/>

Counseling & Mental Health Center: <http://cmhc.utexas.edu/>

Career Exploration Center: <http://www.utexas.edu/student/careercenter/>

Student Emergency Services: <http://deanofstudents.utexas.edu/emergency/>

Subject-to-change notice

Ground rules for participation in discussions or activities

A statement about plagiarism and the consequences of plagiarizing.

<http://www.lib.utexas.edu/services/instruction/faculty/plagiarism/preventing.html>

<http://www.lib.utexas.edu/services/instruction/learningmodules/plagiarism>

Assignments, Assessment, and Evaluation

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