Course Syllabus

GEOS 5470 Structural Geology-Syllabus Spring 2007

Professor Contact Information

Weldon Beauchamp, 214-395-7125 cell, wbeauch@utdallas.edu or weldon@atlasexploration.com
Lectures on Monday and Lab session on Wednesday 5:30-8:15 pm, Classroom: FO2.604
Field trip Days TBA (Most likely to the Wichita Mountains, Oklahoma -Slick Hills-(camp for 2 nights)
Lecture notes will be available after each lecture on website: www.filesanywhere.com
Use name :utdallasgeo Password :pwave
Teaching Assistant: Randy Griffin, office 2.804-Monday 4:30-5:30, griffin@utdallas.edu, 214-532-4884

Course Pre-requisites, Co-requisites, and/or Other Restrictions

PHYS 2325 and 2125 strongly recommended. Co-requisite: GEOS3470801
Field Trip $100 ,Field trip(s) required

Course Description

(4 semester hours) Modern tectonic concepts, survey of major structural provinces, examination of material behavior, stress-strain concepts, failure criteria, soil mechanics, fault analysis, rheology, fold analysis and applications of structural concepts to neotectonics and environmental problems. Training in graphical techniques, use of stereographic projections, and geological map interpretation. Laboratory course. Field trip is mandatory.

Student Learning Objectives/Outcomes

Upon the completion of this course students should be able to do the following:

1. Identify, measure and interpret structures
2. Plot and interpret structural data on a map
3. Interpret structural features from a geological map
4. Use stereonets and maps to convey structural data
5. Construct geological cross-sections from geological maps
6. Explain how structures develop
7. Describe the types of structures that are typical of different tectonic settings

Required Textbooks and Materials

Structural Geology (Lecture)
Second Edition. 2007
Robert J. Twiss (U. of California, Davis)
Eldridge M. Moores (U. of California, Davis)

Basic Methods of Structural Geology (Lab)
Stephen Marshak, University of Illinois
Gautum Mitra, University of Rochester
Publisher: Prentice Hall

Laboratory Items

The course involves a substantial amount of graphical work. Good drafting equipment and good paper are essential.

Required Equipment (Bring to each lab)

Calculator with trigonometric functions
0.5 mm mechanical pencil or drafting pencils with a soft rubber eraser and a small diameter black fine point pen.
Pad of engineering paper (the green ones with light green gridlines)
Pad of 8.5”x11” Clearprint tracing paper (preferably with light blue “fadeout” grid lines).
Clipboard, Drafting tape

Assignments & Academic Calendar

Lecture and Lab Schedule: Please read assignments before lectures and labs

Week	Day	Date	Lecture Subject	Reading	Lab Topic	Reading
1	M	1/8/07	Introduction-Structure & Tectonics, Fractures, joints	Twiss & Moores Ch.1&2		
	W	1/10/07	Measurement of Attitude construction of maps		Strike & dip	M&M Ch.1 & 2
2	M	1/15/07	Introduction to Faults: Normal Faults	Twiss & Moores Ch.3&4		
	W	1/17/07	Geometric Methods I		Attitude Calculations	M&M Ch.3
3	M	1/22/07	Thrust & Strike Slip Faults	Twiss & Moores Ch.5&6		
	W	1/24/07	Geologic map patterns		Dimension Calculations	M&M Ch.4
4	M	1/29/07	Stress	Twiss & Moores Ch.7		
	W	1/31/07	Stereographic Methods I		Concepts & Plotting.	M&M Ch.5
5	M	2/5/07	Mechanics of Fracturing and Faulting	Twiss & Moores Ch.8		
	W	2/7/07	Stereographic Methods 2		Poles and Rotations.	M&M Ch.6
6	M	2/12/07	Mechanics of Natural Fractures & Faults	Twiss & Moores Ch.9		
	W	2/14/07	Calculation of Layer Attitude in Drill Holes		Subsurface Structure	M&M Ch. 7
7	M	2/19/07	Description of Folds	Twiss & Moores Ch.10		
	W	2/21/07	Equal-Area Projections		Fold Geometry	M&M Ch.8
8	M	2/26/07	Foliations & Lineations	Twiss & Moores Ch.11	**MIDTERM EXAM**	
	W	2/28/07	Map Interpretation			M&M Ch.9
9	M	3/12/07	Geometry of Homogeneous Strain	Twiss & Moores Ch.12		
	W	3/14/07	Analysis of Joint, Fault & Lineament Geometry			M&M Ch. 10
10	M	3/19/07	Kinematic Analysis of Folds	Twiss & Moores Ch.13		
	W	3/21/07	Description of Structures in Outcrop			M&M Ch. 11
11	M	3/26/07	Analysis of Foliations & Lineations	Twiss & Moores Ch.14		
	W	3/28/07	Analysis of Fractures			M&M Ch. 12
12	M	4/2/07	Observations of Strain in Deformed Rocks	Twiss & Moores Ch.15		
	W	4/4/07	Construction of Folds		Analysis of Fold Geometry	M&M Ch. 13
13	M	4/9/07	Macroscopic Aspects of Rock Deformation	Twiss & Moores Ch.16		
	W	4/1107	Cross Section balancing		Faulting and folding	M&M Ch. 14
14	M	4/16/07	Microscopic Aspects of Ductile Deformation	Twiss & Moores Ch.17		
	W	4/18/07	Finite Strain		Folding	M&M Ch.15
16	M	4/23/07	**FINAL EXAM**			
	W	4/25/07	**LAB FINAL**			

GEOS 5470 (Graduate course) –Term Projects

The graduate course will entail more homework and additional lab exercises than the undergraduate courses. Graduate students will be required to complete a term project that will participate in the collecting of GIS (geographical information systems) data and 3 dimensional photogrammetry data on field trips. These data will be used to generate computer models that will reproduce the geological exposures visited during the field trips on a computer or in a classroom. Previous data collected in this area will be compared for accuracy to data collected during the course by using GIS techniques. These data will be suitable for publication and the results will be submitted for publication.

Grading Policy

The lecture and laboratory material is tightly integrated in this course. The course requires students to "learn by doing", so the laboratory exercises (which also constitute "homework") are heavily weighted.

Final for lecture 25%
Final for Lab 20%
Lecture midterm 15%
Laboratories/homework 30%
GIS-Mapping Term Project 10% (includes field trip)
TOTAL 100%

Course & Instructor Policies

Students are encouraged to work together on the homework; note that "working together" is not the same as "copying". Neatness, clarity of expression, and completeness are essential in order for full credit on the exams, laboratories, and homework. Homework from the lecture and the lab sections are due the following week.

Field Trip Policies
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 the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

Student Conduct & 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, Series 50000, Board of Regents, The University of Texas System,* 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.

Academic Integrity

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.

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 deal 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 Grade Policy

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**.

Disability Services

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)

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.

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