Fall 2012: GEO371C - Construction and Interpretations of 3D Stratigraphy

(Unique # 27620)

Monday/Friday 1-3 PM Room: JGB2.312

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Office: EPS3.162 Phone: 512-471-2282
Office hours: Tuesday 3:00-4:00PM, Friday 3:00-4:00PM

From Earth surface to subsurface, this course uses three-dimensional volumes of basin-filling stratigraphy to explore how depositional landscapes are preserved in the sedimentary record and how sedimentary deposits can be analyzed to produce quantitative reconstructions of past environmental states. Data will include both laboratory and industry-grade volumes of stratigraphy. Methods for sub-dividing sedimentary deposits into genetically related units will be developed. Stratigraphic signatures of change in water and sediment discharge, base level, and tectonics will be looked at and weighed against apparent stratigraphic trends generated by the naturally occurring variability within sediment-transporting systems.

The course is intended for earth scientists requiring a quantitative understanding of how the structure of depositional landscapes is translated into subsurface stratigraphy. Topics covered in this class will include: 1) generation of sequence boundaries and flooding surfaces; 2) controls on development of unconformities, parasequences, and channel & valley-filling deposits; 3) natural variability in sedimentation patterns; and, most importantly 4) stratigraphic signatures of sea-level, tectonic and climate change.

Friday, August 31	Introduction to Class, Data Sets, and Interpretation Software
Monday, September 3	***Labor Day Holiday***
Friday, September 7	**Begin *Project 1:*** *Sea-level Control on the Production of Stratigraphy: Isolated sea-level cycles – fast versus slow*
Monday, September 10	***Project 1:*** *Sea-level Control on the Production of Stratigraphy: Isolated sea-level cycles – fast versus slow*
Friday, September 14	***Project 1:*** *Sea-level Control on the Production of Stratigraphy: Isolated sea-level cycles – fast versus slow*
Monday, September 17	***Project 1:*** *Sea-level Control on the Production of Stratigraphy: Isolated sea-level cycles – fast versus slow*
Friday, September 21	**PROJECT 1 IS DUE**
Friday, September 21	**Begin *Project 2:*** *Sea-level Control on the Production of Stratigraphy: Superimposed sea-level cycles*
Monday, September 24	***Project 2:*** *Sea-level Control on the Production of Stratigraphy: Superimposed sea-level cycles*
Friday, September 28	***Project 2:*** *Sea-level Control on the Production of Stratigraphy: Superimposed sea-level cycles*
Monday, October 1	***Project 2:*** *Sea-level Control on the Production of Stratigraphy: Superimposed sea-level cycles*
Friday, October 5	**PROJECT 2 IS DUE**
Friday, October 5	**Begin *Project 3:*** *Structural Control on the Development of Stratigraphy: Steering of submarine channels and deep-water sedimentation patterns*

	by spatially varying subsidence patterns – Gulf of Mexico seismic volume
Monday, October 8	***Project 3:*** *Structural Control on the Development of Stratigraphy: Steering of submarine channels and deep-water sedimentation patterns by spatially varying subsidence patterns – Gulf of Mexico seismic volume*
Friday, October 12	***Project 3:*** *Structural Control on the Development of Stratigraphy: Steering of submarine channels and deep-water sedimentation patterns by spatially varying subsidence patterns – Gulf of Mexico seismic volume*
Monday, October 15	***Project 3:*** *Structural Control on the Development of Stratigraphy: Steering of submarine channels and deep-water sedimentation patterns by spatially varying subsidence patterns – Gulf of Mexico seismic volume*
Friday, October 19	**PROJECT 3 IS DUE**
Friday, October 19	**Begin** ***Project 4:*** *Structural Control on Development of Stratigraphy: Steering of rivers and fluvial sedimentation patterns by spatially varying subsidence patterns*
Monday, October 22	***Project 4:*** *Structural Control on Development of Stratigraphy: Steering of rivers and fluvial sedimentation patterns by spatially varying subsidence patterns*
Friday, October 26	***Project 4:*** *Structural Control on Development of Stratigraphy: Steering of rivers and fluvial sedimentation patterns by spatially varying subsidence patterns*
Monday, October 29	***Project 4:*** *Structural Control on Development of Stratigraphy: Steering of rivers and fluvial sedimentation patterns by spatially varying subsidence patterns*
Friday, November 2	**PROJECT 4 IS DUE**
Friday, November 2	**Begin** ***Project 5:*** *Structural Control on Development of Stratigraphy: Growth faulting and sedimentation – Gulf of Mexico seismic volume*
Monday, November 5	***Project 5:*** *Structural Control on Development of Stratigraphy: Growth faulting and sedimentation – Gulf of Mexico seismic volume*
Friday, November 9	***Project 5:*** *Structural Control on Development of Stratigraphy: Growth faulting and sedimentation – Gulf of Mexico seismic volume*
Monday, November 12	***Project 5:*** *Structural Control on Development of Stratigraphy: Growth faulting and sedimentation – Gulf of Mexico seismic volume*
Friday, November 16	**PROJECT 5 IS DUE**
Friday, November 16	**Begin** ***Project 6:*** *Putting it all Together: Evolution of a prograding coastal system – Gulf of Mexico seismic volume*
Monday, November 19	***Project 6:*** *Putting it all Together: Evolution of a prograding coastal system – Gulf of Mexico seismic volume*
Friday, November 23	***Thanksgiving Holiday***
Monday, November 26	***Project 6:*** *Putting it all Together: Evolution of a prograding coastal system – Gulf of Mexico seismic volume*
Friday, November 30	***Project 6:*** *Putting it all Together: Evolution of a prograding coastal system – Gulf of Mexico seismic volume*
Monday, December 3	***Project 6:*** *Putting it all Together: Evolution of a prograding coastal system – Gulf of Mexico seismic volume*
Friday, December 7	**PROJECT 6 IS DUE**

COURSE MATERIALS

Each student will be provided with an external hard-drive to store the stratigraphic volumes on during the class.
IMPORTANT: These hard drives must be returned to the instructor before a grade will be issued for the class.

Assigned Class Readings will be announced at the beginning of each week. Some materials will be placed on the Reserved Shelf in Walter Library.

Lecture notes: Lecture notes and readings from other texts can be found on Blackboard (http://courses.utexas.edu/)

GRADING:

90 % of your grade for this course will be based on the 6 project reports; each report will be worth 15 % of your grade. A project outline will be distributed at the beginning of each of the 6 modules. The expectations for each report will be included in each one of these project outlines.

Each report will be due on the date listed above, at 12:59PM, unless otherwise noted on the class schedule or agreed upon by student and instructor prior to the original due date. Late assignments will be deducted by half a grade for each day past the due date.

10 % of your grade for this course will be based on class participation.

- There are no extra credit assignments in this class.
- +/- letter grades are assigned at the end of the semester based on your scores.

Class Attendance Policy: There is a very strong correlation between the best project reports and class attendance. More than 3 unexcused absences and your final grade will drop one-half letter grade; an additional half-letter grade will be deducted for each additional 2 absences. Field trips, field work, scientific meetings, illness, and family crises can all qualify as excused absences. Please tell the instructor as soon as you know that you will miss a class.

COURSE EXPECTATIONS

- **Laptop Use Policy** – Classroom Laptop use for taking notes related to this course only. Laptop activities unrelated to this course will lead to dismissal from class. **Repeat offenses will result in a filing of a report of academic problems.**

- **Other Electronic Devices (Cell phone, Blackberry, I-Phone, etc.) Use Policy – All devices must be turned off during class.** Any use of these devices, including texting, web-surfing, etc. will lead to dismissal from class. **Repeat offenses will result in a filing of a report of academic problems.**

IMPORTANT INFORMATION ON UNIVERSITY POLICIES

The 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.

Religious Holidays – Religious holy days sometimes conflict with class and examination schedules. If you miss an examination, work assignment, or other project due to the observance of a religious holy day you will be given an opportunity to complete the work missed within a reasonable time **after** the absence. It is the policy of The University of Texas at Austin that **you must notify each of your instructors at least fourteen days prior to the classes scheduled on dates you will be absent** to observe a religious holy day.

Documented Disability Statement - Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities at 471-6259 (voice) or 1-866-329-3986 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations. See Website below for more information: http://deanofstudents.utexas.edu/ssd/providing.php

Use of Blackboard
This course uses Blackboard, a Web-based course management system in which a password-protected site is created for each course. Blackboard can be used to distribute course materials, to communicate and collaborate online, to post grades, to submit assignments, and to take online quizzes and surveys.

You will be responsible for checking the Blackboard course site regularly for class work and announcements. As with all computer systems, there are occasional scheduled downtimes as well as unanticipated disruptions. Notifications of these disruptions will be posted on the Blackboard login page. Scheduled downtimes are **not** an excuse for late work. However, if there is an unscheduled downtime for a significant period of time, we will make an adjustment if it occurs close to the due date.

Blackboard is available at http://courses.utexas.edu. Support is provided by the ITS Help Desk at 475-9400 Monday through Friday 8 a.m. to 6 p.m., so plan accordingly.

University Electronic Mail Notification Policy
(Use of E-mail for Official Correspondence to Students)
All students should become familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. It is recommended that e-mail be checked daily. The complete text of this policy and instructions for updating your e-mail address are available at
http://www.utexas.edu/its/policies/emailnotify.html.

In this course e-mail will be used as a means of communication with students. You will be responsible for checking your e-mail regularly for class work and announcements. Note: if you are an employee of the University, your e-mail address in Blackboard is your employee address.