The University of Texas  Department of Civil Engineering

CE 387G--Engineering Geology
Summer 2005

Instructor:  Dr. Charles Woodruff
ECJ 9.214
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Office hours:  Thursdays 11:30 am-1:00 pm, or by appointment
(please schedule before or after class or call off-campus
number to set up meeting)

Class:       T/Th 10:00-11:30 am
Lab:           Th 1:00-4:00 pm
              ECJ    9.236

Textbook:   Earth, by Frank Press & Raymond Siever
(ISBN 0716717433)

Supplemental material:  Geologic Map of the Austin area,
Texas:  Plate VII from Bureau of Economic Geology Report of
Investigations No. 86, scale = 1:62,500.  This map costs $5
(please reimburse instructor, who will provide a copy to
each student); the full report is out-of-print, but copies
will be placed on reserve in the Geology Library.
Supplemental reading will be assigned from library sources
or hand-outs. A pocket field notebook will be provided to
each student for use during the course.

Optional materials that may be useful during the class
include a hand lens, a rock hammer, a camera, and a glossary
of geologic terms. Instructor will provide a few rock
hammers for shared use during field trips.

COURSE OBJECTIVES:
To present the fundamentals of geology in a way that is
relevant to Civil Engineers. The course will focus on
geologic materials, earth processes, and landforms, all of
which evolve through the vast amounts of geologic time to
produce global conditions that we see today. The three-way
interactions among materials, landforms, and processes
provide challenges to Civil Engineers in their work siting,
designing, and maintaining structures and facilities.
Although the overall scope of the course will be global, a
major emphasis will focus on the Austin area, and nearby
localities. Most laboratory sessions will be conducted in
the field.
COURSE PREREQUISITES:
Graduate standing in Civil Engineering; no prior course work in geology is assumed.

CLASS/LAB/FIELD WORK:
The course grade will be based on attendance and participation in class, laboratories, and field trips, completion of homework and projects, and the maintenance of a field notebook, which will be turned in at the request of the instructor.

The course will include one day-long (circa 7:00 a.m.- 5:00 p.m.) field trip to view the varied geologic conditions of the Llano Uplift. This trip is scheduled for Thursday, 4 August. Also there will be two "long" Thursday field trips that will span the time periods including both lecture and lab periods (i.e. 10 a.m. to circa 4 p.m.). For all these trips, students will be expected to bring their own lunches and drinking water. For all trips, everyone should dress appropriate to summer conditions in Texas: Wear hats, use sunscreen, and wear durable, lace-up shoes or boots with rubber soles (no sandals!).

PROJECT/REPORT:
Each student will complete an outside (library) research project that pertains to the interface between Civil Engineering and geology. Preferred topics include case studies of notable "failures" (or "events") involving geologic processes or conditions that impact man-made facilities. Other suitable topics may include reports on specific geologic conditions that bear on engineering and land use of a city or region. Topics are subject to prior approval by instructor. Products of this research will include a 20-minute oral report to the class, and a brief (5-7 page) written/illustrated report of findings, with an abstract to be distributed to all other class participants. Written reports are due on 9 August; oral reports are to be presented on 11 August.

EXAMS:
Two examinations will be given: Mid-term exam on Tuesday, 5 July, 10:00 am to 11:30 am; Final exam is scheduled on Saturday, 13 August, 9:00 am - noon. Other in-class quizzes may be given at the discretion of the instructor.
Grading:
The final grade will be computed as follows:

- Class participation/exercises/homework, quizzes = 20%
- Lab/field participation = 20%
- Field notebook = 10%
- Mid-term Exam = 10%
- Final Exam = 20%
- Individual Research Project
  - Written report = 10%
  - Oral Presentation = 10%

COURSE/INSTRUCTOR EVALUATION:
A course evaluation (standard MEC Form) will be conducted in class near the end of the semester.

ADDS/DROPS:
For Graduate Students: From the 1st through the 2nd class day, graduate students can drop a course on Rose or TEX and receive a refund. During the 3rd through 4th class day, graduate students must initiate drops in their department and receive a refund. After the 4th class day, no refund is given. Graduate students can drop a class until the last class day with permission from the departmental graduate advisor and the Dean. Students with the 20-hr/week GRA/TA appointment or a fellowship may not drop below 3 hours in the summer. (These 3 hours can be in any summer term.)

STUDENTS WITH DISABILITIES:
The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Services for Students with Disabilities area of the Office of the Dean of Students at 471-6259 as soon as possible to request an official letter outlining authorized accommodations. For more information, contact that Office, or TTY at 471-4641, or the College of Engineering Director of Students with Disabilities at 471-4321.

PRIVACY POLICY re: WEB-BASED CLASS SITES:
Web-based, password-protected class sites will be associated with all academic courses taught at the University. Syllabi, handouts, assignments and other resources are types of information that may be available within these sites.
Site activities could include exchanging e-mail, engaging in class discussions and chats, and exchanging files. In addition, electronic class rosters will be a component of the sites. Students who do not want their names included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1. For information on restricting directory information, see p. 7 of the Course Schedule (or) http://www.utexas.edu/student/registrar/catalogs/gi00-01/app/appc09.html

COURSE OUTLINE:

Week 1: Overview of course; introduction to the science; philosophical/historical matters; general administrative issues (Diagnostic Test); whole earth and global processes; introduction to geologic time
Lab: Walking tour of U.T. Campus

Week 2: More ordering principles (introduction to concept of global tectonics); introduction to geology of Austin; earth materials
Lab: In-town field trip: East and West of Mount Bonnell

Week 3: Materials of the Earth: rocks and minerals; rock cycle; interface with other global cycles; introduction to "soil"
Lab: Rocks and Minerals

Week 4: Rock cycle and Earth materials, cont'd; water, rock, and soil
Thursday 23 June: "Long" Lecture/Lab field trip: Canyon Dam

Week 5: Introduction to stratigraphy and structure
Lab: Soils, faults, and ground-stability in the Austin area
Tuesday, 5 July: Mid-Term Exam

Week 6: Stratigraphy, Structure, Geologic Maps
Lab: Airphotos and maps

Week 7: Surface processes: Introduction to Geomorphology and Landforms
Thursday 14 July: "Long" Lecture/Lab field trip: Blackland Prairies/Inner Gulf Coastal Plain

Week 8: Surface Processes, cont'd; Karst; Urban hydrology
Lab: Visit local sources of geotechnical data; visit construction site (depending on permission)
Week 9: Earthquakes and Volcanoes
Lab: Edwards Aquifer field trip; Urban Hydrology

Week 10: Site assessments/environmental impact statements; "Ten Ways to be Wrong"

Thursday, 4 August: All-day Llano field trip (Central Texas Geology from the Precambrian on...)

Written reports due on Tuesday, 9 August

Week 11: Course recapitulation; semester review, and course evaluations; oral reports on Thursday, 11 August

Final Examination: Saturday 13 August, 9:00 a.m. - noon

End