

GEOS 5484 (GEOPHYSICAL TECHNIQUES II)
FALL 2005 AGENDA
INSTRUCTORS: J. FERGUSON and G. MCMECHAN

4 semester hours

An introduction to the theoretical and practical aspects of geophysical data collection. The planning and execution of small-scale surveys, of the type employed in engineering, groundwater and environmental site evaluations, are featured. Techniques covered include both refraction and reflection seismology and both low and high frequency, single and multi-channel ground-penetrating radar. Advantage is taken of both the similarities and complementary behaviors of seismic and radar waves. An integration, of both seismic and radar data, as well as data from the methods covered in Geophysical Techniques I, is emphasized in interpretation. A background in calculus and general physics is required. Prerequisite: permission of instructor.

Grading will be on the basis of a midterm quiz (20%), a final exam (20%), and lab exercises and final lab report (60%).

Instructors can be reached via the following:

Ferguson: e-mail ferguson@utdallas.edu
phone 972-883-2410
fax 972-883-2537

McMechan: e-mail mcmec@utdallas.edu
phone 972-883-2419
fax 972-883-2829

Text Book (required):

An Introduction to Applied and Environmental Geophysics
Author: John M. Reynolds
Publisher: John Wiley & Sons (1998)
ISBN 0-471-95555-8 (paperback)

CLASS #	TOPIC	INSTRUCTOR
THEORETICAL BASIS		
1	SEISMOLOGY	J.F.
2	GROUND PENETRATING RADAR	G.M.
PROPERTIES AND BEHAVIORS OF EARTH MATERIALS		
3	ACOUSTIC & ELASTIC	J.F.
4	ELECTRIC, MAGNETIC & DIELECTRIC	G.M.
HARDWARE + ACQUISITION SOFTWARE		
5	SEISMIC (REFRACTION & REFLECTION)	J.F.
6	GPR (LOW AND HIGH FREQUENCY)	G.M.
DATA ACQUISITION, PROCESSING & INTERPRETATION		
7	REFRACTION SEISMOLOGY	J.F.
8	SURVEY PARAMETER SELECTION AND NUMERICAL SYNTHESIS OF GPR DATA	G.M.
9	REFLECTION SEISMOLOGY	J.F.
10	IMAGING, MIGRATION & TOMOGRAPHY FOR GPR DATA	G.M.
ENVIRONMENTAL AND ENGINEERING APPLICATIONS		
11	SEISMIC	J.F.
12	GPR	G.M.

APPROXIMATE DATES

Tuesday

Aug 23 1J
Aug 30 2G
Sept 6 3G
Sept 13 4J
Sept 20 5G
Sept 27 6J
Oct 4 7J
Oct 11 Mid Term Exam
Oct 18 8G
Oct 25 9J
Nov 1 10G
Nov 8 SEG Meeting - No Class
Nov 15 11J
Nov 22 12 G Lab Reports Due
Nov 29 Final Exam (2 PM)

Saturday

Aug 27
Sept 3 Radar Processing
Sept 10
Sept 17 Seismic Fieldwork
Sept 24 Radar Fieldwork
Oct 1
Oct 8 Seismic Fieldwork
Oct 15
Oct 22
Oct 29 Radar Fieldwork
Nov 5
Nov 12
Nov 19
Nov 26 Holiday