

**Dr. Stephen K. Boss**  
*Department of Geosciences*  
**University of Arkansas**  
*Fayetteville, Arkansas, USA*  
**GEOPHYSICS**



**GEOL 4433 - GEOPHYSICS**  
**TENTATIVE SYLLABUS - Fall Semester 2006**

| Inclement Weather | Religious Observances | Grading |

Syllabus

Expectations

Lab Schedule

Slide Sets

Exam Answers - Current Semester

Student Grade Statistics

Geophysics Current Events

Geophysics Careers

Geophysics Glossary

Geophysics Links

**CONTACT INFORMATION:**

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**TEXTBOOK:** Robinson, E.S. and Coruh, C., 1988, Basic Exploration Geophysics, New York, John Wiley & Sons, 562p..

**OFFICE:** Wednesdays, 2:00 - 5:00 p.m. in Ozark Hall room 202.  
Phone: 479-575-7134 or 479-575-6603

**WEEK 1**

08/21/06 M Policies & Procedures in GEOL 4433  
Read: Preface, Ch. 1

08/23/06 W ROCK PHYSICS: Elastic Properties of Rocks  
Read: Ch. 2, 15-19.

08/25/06 F ROCK PHYSICS: Elastic Properties of Rocks  
Read: Ch. 2, 15-19.

**WEEK 2**

08/28/06 M LAB 01: GEOPHYSICS ON THE INTERNET

08/30/06 W ROCK PHYSICS: Seismic Phases  
Read: Ch. 2, 31-36

09/01/06 F ROCK PHYSICS: Seismic Velocities  
Read: Ch. 2, 31-36

**WEEK 3**

09/04/06 M NO CLASS - LABOR DAY HOLIDAY

09/06/06 W SEISMIC REFRACTION: Introduction to Seismic Refraction and Snell's Law  
Read: Ch. 3, 39-45

09/08/06 F SEISMIC REFRACTION: Single and Multi-Layer Refraction  
Read: Ch. 3, 51-56

**WEEK 4**

09/11/06 M LAB 02: SEISMIC REFRACTION V.1.0

09/13/06 W SEISMIC REFRACTION: Multi-Layer Refraction Continued  
Read: Ch. 3, 51-56

09/15/06 F EXAM I

**WEEK 5**

09/18/06 M LAB 03: GEOPHYSICAL RESOURCES: UA Library data bases - Ms. Jan Dixon

09/20/06 W INTRODUCTION TO SEISMOLOGY: Wave Forms in the Earth  
Read: Assigned Supplemental Reading

09/22/06 F EARTHQUAKES & SEISMOTECTONICS: General Principles of Earthquake Generation  
Read: Assigned Supplemental Reading

**WEEK 6**

- 09/25/06 M LAB 04: SEISMIC REFRACTION V.2.0
- 09/27/06 W EARTHQUAKE FOCAL MECHANISMS: Locating Earthquakes and Determining Fault Movements  
Read: Finding an Earthquake's Location with Modern Seismic Networks (USGS)
- A Draft Primer on Focal Mechanism Solutions for Geologists (Dr. V. Cronin, Baylor University)
- 09/29/06 F EARTHQUAKE MAGNITUDES: Seismic Moments and Magnitude Determination  
Read: What is Richter Magnitude? (Dr. N. Louie, U. of Nevada - Reno)
- Earthquake Magnitude and Intensity (Dr. N. Pinter, S. Illinois University)

**WEEK 7**

- 10/02/06 M LAB 05: GLOBAL SEISMOLOGY V.1.0
- 10/04/06 W EARTHQUAKES & GLOBAL SEISMOLOGY: Plate Tectonics and Earthquakes  
Read: Seismology and the new global tectonics
- 10/06/06 F EARTHQUAKES & GLOBAL SEISMOLOGY: Earthquakes and Earth Structure  
Read: Discovery of the Earth's Core (Dr. S. Stein, Northwestern U.)
- Short biography of Inge Lehmann, discoverer of Earth's inner core

**WEEK 8**

- 10/09/06 M LAB 06: INTRODUCTION TO REFLECTION SEISMOLOGY V.1.0
- 10/11/06 W SEISMIC REFLECTION: Basic Principles of Seismic Reflection Profiling  
Read: Ch. 4, p.81-107
- 10/13/06 F SEISMIC REFLECTION: Basic Principles of Seismic Reflection Profiling  
Read: Ch. 4, p.107-115

**WEEK 9**

- 10/16/06 M EXAM II 2:30 - 4:20 p.m.
- 10/18/06 W SEISMIC REFLECTION: Seismic Data Processing  
Read: Ch 6, p.163-175
- 10/20/06 F SEISMIC REFLECTION: Seismic Data Processing  
Read: Ch. 6, p.175-199.

**WEEK 10**

- 10/23/06 M NO CLASS - GEOLOGICAL SOCIETY OF AMERICA MEETING
- 10/25/06 W NO CLASS - GEOLOGICAL SOCIETY OF AMERICA MEETING
- 10/27/06 F SEISMIC REFLECTION: Interpreting Reflection Profiles

**WEEK 11**

- 10/30/06 M LAB 07: INTERPRETING SEISMIC REFLECTION DATA
- 11/01/06 W GRAVITY SURVEYING: Introduction to Earth's Gravity  
Read: Ch. 7, 221-246
- 11/03/06 F GRAVITY SURVEYING: Gravity Reductions  
Read Ch. 8, 249-276

## WEEK 12

11/06/06	M	LAB 08: GRAVITY SURVEYING
11/08/06	W	HEAT FLOW: Introduction to Heat Flow Read: Assigned Supplemental Reading
11/10/06	F	HEAT FLOW: Heat Flow & Geology Read: Assigned Supplemental Reading

## WEEK 13

11/13/06	M	EXAM III: 2:30 - 4:20 p.m.
11/15/06	W	EARTH MAGNETISM: Magnetic Reversal Stratigraphy Read: Ch. 10, 367-373, Vine & Matthews, 1963
11/17/06	F	EARTH MAGNETISM: Present Field Dynamics Read: Assigned Supplemental Reading

## WEEK 14

11/20/06	M	LAB 09: MAGNETIC REVERSAL STRATIGRAPHY & PLATE TECTONICS
11/22/06	W	NO CLASS - THANKSGIVING - EAT, DRINK, AND BE MERRY
11/24/06	F	NO CLASS - THANKSGIVING - EAT, DRINK, AND BE MERRY

## WEEK 15

11/27/06	M	LAB 10: MISCELLANEOUS GEOPHYSICAL OBSERVATIONS: Optical Geophysics
11/29/06	W	MISCELLANEOUS GEOPHYSICAL OBSERVATIONS: Satellite Geophysics Read: Assigned Supplemental Reading
12/01/04	F	MISCELLANEOUS GEOPHYSICAL OBSERVATIONS: Satellite Geophysics Read: Assigned Supplemental Reading

## WEEK 16

12/04/06	M	COURSE EVALUATIONS & FINAL EXAM REVIEW
12/06/06	W	DEAD DAY - NO CLASSES
12/11/06	M	NOTE MONDAY - Final Examination - 3:00 - 5:00 p.m.

## NOTES ON GRADING POLICIES FOR THIS COURSE:

Your grade for this course will be determined by your performance on the laboratory assignments and the three examinations. Your overall grade for the course will be apportioned as follows:

Laboratory Assignments (9) 25%

Examinations (4) 75% - The final examination will be comprehensive. Exam I = 15% of your final grade, Exams II, III, and final = 20% each of your final grade.

**Please note that late assignments and exams will neither be accepted nor graded by me.**

Grading laboratory assignments and exams for this course is a very time-consuming endeavor for which I must carefully budget my time. I will not tolerate assignments trickling in after posted deadlines.

**There will be no exceptions, so don't ask!**

Additionally, you may expect grades to be determined according to the following guidelines:

A 90% or better

B 89% - 80%

C 79% - 70%

D 69% - 60%

F 59% or below

**NOTES ON RELIGIOUS OBSERVANCES:**

The University of Arkansas does not observe religious holidays. However, the Campus Council has passed a resolution concerning individual observance of religious holidays as it pertains to class attendance. In accordance with the wishes of the Campus Council, the following policy regarding religious observances will be adhered to in this course:

*When members of any religion seek to be excused from class for religious reasons, they are expected to provide their instructors with a schedule of religious holidays that they intend to observe, in writing, before the completion of the first week of classes.*