

**Revised 1/19/06**

**Reflection Seismic Data Interpretation - GEY 772/772L – Spring 2006**

**Room TEC 104**

**Lecture: TR 4:00 - 5:15**

**Lab: W 11:30 - 2:15**

**Instructor:** Dr. Catherine Snelson

**Office Hours:** W 9:30 – 10:30 am; R 3:00 - 4:00 pm; or by appointment

**Office:** LFG 204

**Office Phone:** 895-2916

**E-mail:** csnelson@unlv.nevada.edu

**Text:** None

**Additional Reference Material:** Exploration Seismology, Sheriff and Geldart; Seismic Data Processing, Yilmaz; and Practical Seismic Interpretation, Badley; A Lab Manual of Seismic Reflection Processing, Young; Papers handed out in class and some available on WebCT.

**WebCT:** <https://webctce.unlv.edu/webct/public/home.pl>

**Purpose of this Course**

This class is designed for geologists and geophysicists interested in learning the fundamentals of geologic interpretation of 2D and 3D reflection seismic data. The class provides hands on experience in the structural and stratigraphic interpretation of seismic reflection data.

**Course Objectives – to acquire an understanding of the following:**

1. Well log to seismic ties
2. Developing contour maps
3. Developing fault plane maps
4. Time-to-depth conversion
5. Seismic sequence analysis
6. Workstation interpretation of 3D data
7. Effects of seismic acquisition and processing on interpretation

**Grading:**

Hourly Exam: 15%

Class presentations: 10%

Class exercises: 55%

Final Project: 20%.

**This syllabus is subject to change.**

**Succeeding!**

To do well in this class you should study and work with the material daily. If you get confused or have questions that have not been resolved in lecture, then do not hesitate to contact me. If you cannot make any of the office hours, call or email for an appointment.

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### Logistics and Policies

#### 1. Participation:

You are expected to be an active participant in the course and much class activity will involve group discussions.

#### 2. Attendance

Missing or late exercises are not permitted. In cases of emergency, notify me at least one hour prior to the scheduled due date. In addition, it is suggested that you attend the weekly Departmental Seminar series, which is held every Wednesday from 4:00 to 5:00 pm. This is in effort to learn new information outside your discipline as well as critique presentation styles and content.

#### 3. Cheating, Plagiarism, and Academic Dishonesty

You are required to be familiar with university policies and procedures in the current UNLV Undergraduate Catalog. Importantly, we follow the policies on Cheating, Plagiarism, and Academic Dishonesty that are stated in the most recent UNLV Undergraduate Catalog. In the hopes of deterring incidents of cheating and/or plagiarism this class employs a "zero tolerance" policy meaning that if a student commits cheating or plagiarism they receive a grade of F for the class.

#### 4. Copyright Issues

The University requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. YOU ARE INDIVIDUALLY AND SOLELY RESPONSIBLE FOR VIOLATIONS OF COPYRIGHT AND FAIR USE LAWS. THE UNIVERSITY WILL NEITHER PROTECT YOU NOR DEFEND YOU NOR ASSUME RESPONSIBILITY FOR EMPLOYEE OR STUDENT VIOLATIONS AND FAIR USE LAWS. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability as well as disciplinary action under University policies. To familiarize yourself with copyright and fair use policies, the University encourages you to visit its copyright web page at: <http://www.unlv.edu/committees/copyright>.

#### 5. Disability Services (DS)

The UNLV Disability Resource Center (DRC) houses the resources for students with disabilities. If you have a documented disability that may require accommodations, you will need to contact the DRC for the coordination of services. The DRC is located in the Student Services Complex (SSC), Room 137. Their numbers are: (702) 895-0866/Voice; (702) 895-0652/TDD; and (702) 895-0651/Fax. For additional information please visit <http://www.unlv.edu/studentlife/drc>.

#### 6. Writing Center

Students are welcome to use the UNLV Writing Center free of charge. Consultants can assist students at all stages of the writing process. Students may make appointments by calling the center (895-3908) or in person at FDH-240. The center can be particularly helpful when you are writing or rewriting your lab field reports.

#### 7. Religious Holidays

As a general rule, a student missing a class or laboratory assignment because of observance of a religious holiday shall have the opportunity to make up missed work. You must notify me by the last day of late registration to be assured of this opportunity. If this pertains to you, a clear deadline will be set for completion of work.

**8. Nondiscrimination** - The University of Nevada Las Vegas does not discriminate on the basis of race, color, creed, religion, national or ethnic origin, gender, age, sexual orientation, disability, or veteran status.

#### 9. Official Extracurricular Activity

All students who represent UNLV at an official extracurricular activity shall have the opportunity to make up assignments, but you must provide official written notification to me no less than one week prior to the missed class(es).

#### 10. Learning Environment

The classroom is intended to be a place of learning. As such and as specified in the UNLV Undergraduate and Graduate Catalogs, no pagers, cell phones, or other potentially disruptive devices are allowed in either lecture or the laboratory.

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CLASS SCHEDULE

Wk	Date	Lecture Topic	Lab Topic	Reading
1	Jan 17	Organization, Introduction to Reflection Seismic Data	Organization – Set up SPW; Set up accounts on Kingdome Suite	Skim Sheriff and Geldart sections 2.1-2.4, 2.7, chapter 4
2	Jan 24	Seismic Raypaths and Reflections; Seismic Data Processing	Seismic Raypaths and Reflection Coefficients	Sheriff and Geldart sections 6.1-6.3, 6.7; Yilmaz, pp. 9-41
3	Jan 31	Seismic Data Processing - Interpreter's Viewpoint	Filtering and Convolution	Sheriff and Geldart chapter 9; Yilmaz, pp. 43-62
4	Feb 7	Seismic Resolution, Migration, 3D-Seismic Reflection	Time to Depth Conversion, Migration; Introduction to SPW	Sheriff and Geldart section 6.4, chapter 12; Badley, pp. 9-69
5	Feb 14	Contouring, <b>Hourly Exam</b>	SPW Labs 1 - 4	Badley, pp. 211-234; Young pp. 9 - 46
6	Feb 21	Introduction to Structural Interpretation of Seismic Data	SPW Labs 5 - 9	Young pp. 47 - 88
7	Feb 28	Structural Styles in Extensional Tectonic Regimes	SPW Labs 10 – 12; Appendix 1	Young pp. 89 - 118
8	Mar 7	Structural Styles in Compressional Tectonic Regimes	Introduction to Kingdome Suite; Contouring	
9	Mar 14	No Class – Spring Break	No Assignment -- Hit the Beach !!	
10	Mar 21	Structural Styles in Strike-slip Tectonic Regimes	Triassic Rift Basin Mapping Project	
11	Mar 28	Oral Presentations -- Structural Interpretation Case Histories	Rocky Mountain Mapping Project	
12	Apr 4	Introduction to Seismic Stratigraphy	No Lab – Work on Projects	
13	Apr 11	Principles of Seismic Stratigraphic Interpretation	Seismic Sequences; Submarine Fan Stratigraphic Interpretation	
14	Apr 18	Seismic Sequence Stratigraphy	No Lab – Work on Projects	
15	Apr 25	Seismic Sequence Stratigraphy	Sequence Stratigraphy	
16	May 2	Oral Presentations -- Stratigraphic Interpretation Case	No Lab – Work on Projects	
17	May 9	FINAL PROJECT DUE 6 pm		