

## **GEOLOGY 3408** **Stratigraphy and Sedimentology**

Fall 2016

Biology, Geology and Physical Sciences Department  
College of Arts and Sciences, Sul Ross State University

MWF 9:00 pm – 9:50 pm

Lab Thrs 2 – 5 pm (Alpine); TBA (Midland)

Instructor: Dr. Elizabeth Measures  
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Office Hours:  
MWF 10:00 – 10:30 am  
TuTh 9:30 – 10:30 am  
MT 2:00 – 3:00 pm  
or by appointment

Lab Instructors: Jake Roberson (Alpine); Matthew Boggs (Midland)

### **COURSE DESCRIPTION**

The course covers the processes governing the formation, distribution and accumulation of recent sediments (weathering, erosion, transportation and deposition), which establish the guiding principles of facies analysis used in the classification, correlation and environmental interpretation of ancient, stratified sedimentary rocks. The stratigraphic record is largely the result of the continuity of sedimentary processes through the dimension of geologic time. The course also covers numerous aspects of stratigraphy such as lithostratigraphy, biostratigraphy, and sequence stratigraphy.

### **PREREQUISITE**

GEOL 1103/1303 Physical Geology lecture and lab

### **METHOD(S) OF INSTRUCTION**

The course consists of three hours of lecture (face-to-face/distance ed) by Measures and three hours (minimum) of lab work. Several field trips will be offered; only one field trip is required.  
Blackboard will be used to some extent. Notification of material posted will be delivered through Sul Ross email.

### **FIELD TRIP(S)**

There will be at least one required day-long field trip. There may be several optional trips. Optional trips may be day-long or weekend overnight trips.

### **REQUIRED TEXT**

*Sedimentology and Stratigraphy*, 2<sup>nd</sup> edition. 2009. Gary Nicols.  
ISBN-10: 1405135921  
No lab text.

### **REFERENCE MATERIAL(S)**

Other books to be used for reference will be available in the lab. Handouts will be posted on Blackboard.  
Applicable geological journal articles will be required reading as well.

### **COURSE MATERIAL(S)**

notebook paper   pencils (required for tests and labs)   hand lens (optional)

### **ATTENDANCE POLICY**

You are expected to attend lectures and required to attend labs; arrive on time and stay for the duration of the class period.  
You are expected to be engaged; stay awake and on task.

**ELECTRONICS POLICY**

The only approved use of electronics is for taking notes or recording the class. Class recordings are not to be posted on any social media site.

Electronics/cell phones/smart phones are to be turned OFF and put in book bags/purses.

They are not to be held in your lap or in a pocket of clothing or placed face down on top of table.

You must email the instructor with a detailed explanation and need for access to a phone, or text capable device, to be exempted from this policy.

**CONDUCT POLICY**

Tardiness, leaving and returning during class/lab time, and not staying until the end of class/lab are not acceptable for other than legitimate reasons, which are determined by the instructor. Legitimate reasons include rapid onset of events, or unexpected events, such as illness (hangovers are not an illness), vehicle issues, family emergency, caregiver responsibilities, emergency responder calls, medical/ dental appointments **with specialists.**

Schedule appointments around class/lab time.

Sleeping in class will not be tolerated; you will leave and go home, or to your vehicle, or to the nearest park bench to sleep.

Texting in class will not be tolerated; you will leave for the remainder of the class period.

Points will also be deducted from the next exam.

Looking at, or listening to, electronic devices during class will not be tolerated; you will leave for the remainder of the class period. Points will also be deducted from the next exam.

Laptop/notebook/notepad usage is to be limited to note-taking. Surfing the internet, playing games, checking email or working on a different class will not be tolerated; you will leave for the remainder of the class period. Points will also be deducted from the next exam.

**STUDENT RESPONSIBILITY**

You are expected to get notes from another student IF you miss class.

You are expected to check your Sul Ross email once a day.

You are expected to do any missed tests or labs within a week of the missed test/lab. This requires you to notify and co-ordinate with the instructor within one or two days of the missed test/lab.

**GRADING/COURSE REQUIREMENTS**

The semester grade:

54% exams (3)

25% lab

11% homework (10)/participation

10% field exercise

Grading Scale:

100 to 90.0 A

89.9 to 80.0 B

79.9 to 70.0 C

69.9 to 60.0 D (does not count toward geology major credit)

< 59.9 F

**Exams**

The first two exams cover the previous 4 to 4.5 weeks of material. Exam 2 is only comprehensive in the sense that some material carries through. The last exam (during finals week) is comprehensive. Exam material will come from lectures, homeworks, labs and other items as assigned and covered during the 4 to 4.5 weeks prior to the exam. Types of questions: true/false, matching, fill-in-the-blank, multiple choice, photo/diagram identification, sketching, labeling, short answer, and discussion/essay.

**Lab**

Involves hands-on identification, practice and application of material covered in lecture. There are weekly exercises over sedimentology and stratigraphy. There will also be at least two lab practicals. The detailed lab grade breakdown will be explained in lab.

**Homework/Participation**

There will be up to 10 sets of questions based on readings from the text. Class participation will be based on perceived engagement during lectures.

**Field Exercise**

The one required field trip will have students identify and apply material covered in lecture and lab to a real world situation. The exercise involves application of geologic field techniques to sedimentology and stratigraphy.

**DISABILITIES ACCOMMODATION**

Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the policy of SRSU to provide reasonable accommodation to students with disabilities. If you would like to request such accommodation because of a physical, mental, or learning disability, please contact the Accessibility Services Coordinator (ADA coordinator), in Counseling & Accessibility Services, Ferguson Hall room 112, 432-837-8691. It is the student's responsibility to initiate a request for accessibility services.

You will be provided with an accommodation letter which must be given to the instructor as early as possible in the semester.

**DISTANCE EDUCATION POLICY**

Students enrolled in distance education courses have equal access to the university's academic support services (such as Smarthinking), library resources (such as online databases), and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should submit online assignments through Blackboard or SRSU email, which require secure login information to verify students' identities and to protect students' information. All lecture exams will be proctored. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students must maintain appropriate equipment, according to the needs of the course, as outlined on the SRSU website.

**EXPECTED STUDENT LEARNING OUTCOMES**

At the end of the semester, the successful student will be able to:

- \* Identify, interpret and explain aspects of sediment and sedimentation as they have recorded Earth history and have differed through Earth history; *SLO # 1 ... apply a diverse body of geologic information in the area of Earth history.*
- \* Contrast sedimentary depositional environments and their facies and evaluate their change and importance through Earth history; *SLO # 1 ... apply a diverse body of geologic information in the area of Earth history.*
- \* Identify, interpret and explain aspects of lithostratigraphy, biostratigraphy, seismic stratigraphy and sequence stratigraphy; *SLO #2 ... apply a diverse body of geologic information in the area of stratigraphy.*
- \* Illustrate, analyze and evaluate a stratified sediment or rock sequence; *SLO #2 ... apply a diverse body of geologic information in the area of stratigraphy.*
- \* Demonstrate familiarity with and use of field techniques used in the study of sedimentology and stratigraphy; *SLO #3 ... apply a diverse body of geologic information in the area of field techniques.*
- \* Devise and design a schematic representation of a real-world stratified sediment or rock sequence; *SLO #3 ... apply a diverse body of geologic information in the area of field techniques.*

The course combines practical, hands-on experience in the lab with field exercises.

schedule is subject to change depending on progress of class and weather

MONDAY		WEDNESDAY		THURSDAY		FRIDAY	
Aug 24	Intro to Strat & Sed; definitions (C 1)	Aug 24	Uniformitarianism & other "-isms" (C 1)	Aug 25	NO LAB	Aug 26	Facies, Walther's Law (C 1)
Aug 29	Plate Tectonics & Sed (C 6)	Aug 31	Review of Minerals & Sed Rocks	Sept 1	Review of Mins & Sed Rocks	Sept 2	Types of "sediment" (C 2,3)
Sept 5	LABOR DAY HOLIDAY	Sept 7	Types of "sediment" (C 2,3)	Sept 8	Sand	Sept 9	Sed Transport (C 4)
Sept 12	Sed Structures (C 4, 18)	Sept 14	Sed Structures (C 4, 18)	Sept 15	Sed Struct pt I	Sept 16	Glacial Deposits (C 7)
Sept 19	Alluvial Fan Deposits (C 9)	Sept 21	Review for Exam 1 Finish Lec Matrl	Sept 22	Sed Struct pt II	Sept 23	<b>EXAM 1</b>
Sept 26	Eolian Deposits (C 8)	Sept 28	Lake Deposits (C 10)	Sept 29	Sieve Sed Analysis pt I	Sept 30	Stream Deposits (C 9)
Oct 3	Stream Deposits (C 9)	Oct 5	Stream Deposits (C 9)	Oct 6	Sieve Sed Analysis pt II	Oct 7	Delta Deposits (C 12)
Oct 10	Delta Deposits (C 12)	Oct 12	Beach Deposits (C 13)	Oct 13	LAB PRACTICAL 1	Oct 14	Beach Deposits (C 13)
Oct 17	Estuarine Deposits (C 13)	Oct 19	Shallow Marine Clastic Deposits (C 14)	Oct 20	Maps: Isopach & Struct Contour pt I	Oct 21	Shallow Marine Clastic Deposits (C 14)
Oct 24	Review for Exam 2 Finish Lec Matrl	Oct 26	<b>EXAM 2</b>	Oct 27	Maps: Isopach & Struct Contour pt II	Oct 28	Shallow Marine Carb Deposits (C 15)
Oct 31	Shallow Marine Carb Deposits (C 15)	Nov 2	Deep Marine Deposits (C 16)	Nov 3	Permian Basin	Nov 4	Misc Deposits (C 15, 17)
NOV 7	Strat Basics (C 19)	Nov 9	Lithostrat (C 19)	Nov 10	Correlation; Lith, Bio	Nov 11	Biostrat (C 20)
Nov 14	Biostrat (C 20)	Nov 16	Subsurface (C 22)	Nov 17	LAB PRACTICAL 2	Nov 18	Subsurface (C 22)
Nov 21	Seq Strat (C 23)	Nov 23	THANKSGIVING HOLIDAY	Nov 24	THANKSGIVING HOLIDAY	Nov 25	THANKSGIVING HOLIDAY
Nov 28	Seq Strat (C 23)	Nov 30	Review for Exam 3	Dec 1	DEAD DAY		
<b>TUESDAY DEC 6 8 TO 10 AM EXAM 3 this is during finals</b>							

**GEOLOGY UNDERGRADUATE (BACHELOR OF SCIENCE) STUDENT LEARNING OBJECTIVES (SLO's)**

1. The student will be able to apply a diverse body of Geologic information in the area of Earth History.
2. The student will be able to apply a diverse body of Geologic information in the area of mineralogy and petrology.
3. The student will be able to apply a diverse body of Geologic information in the area of structural geology and tectonics.
4. The student will be able to apply a diverse body of Geologic information in the area of stratigraphy.
5. The student will be able to apply a diverse body of Geologic information in the area of field techniques.

**METHODS OF ASSESSMENT/EVALUATION**

Learning outcome assessments are the comprehensive lab practical(s) (SLO 1) and the applied stratigraphic field exercise (SLO 4, SLO 5).

These assessments are applications of material covered in lecture and lab.

Comprehension of lecture material is based on 3 exams that assess critical reasoning and problem solving; the most frequently missed questions on the first two exams are re-phrased and assigned as homework. The last exam is the final so there is no opportunity for homework questions based on the most frequently missed questions.

Labs are application of lecture material. Comprehension of lab material is based on up to two lab practicals; the most frequently missed questions on the first practical are re-visited on subsequent labs and the remaining lab practical.