

GEOL 3408 – Stratigraphy and Sedimentation

Fall - 2019

Section: 001

Lecture Times: MWF: 1-1:50 pm

Instructor: Dr. Tom Shiller

Office: WSB 319

Office Hours: MWF: 12:00-1:00 pm, 5:00-6:00 pm; or by appointment

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Materials Required:

Sedimentology and Stratigraphy, 2nd edition. 2009. Gary Nichols. ISBN-10: 1405135921

No lab text.

Course Purpose:

This course will cover the processes of weathering, transportation and deposition of sediment, and the formation of sedimentary rock. Stratified sedimentary rocks and their spatial/temporal relationships are a chief topic in this course. The sub-disciplines of stratigraphy to be covered include lithostratigraphy, the study of rock strata; biostratigraphy, the study of fossils in sedimentary rocks and how they relate to geologic time; and sequence stratigraphy, the study of patterns of sedimentary strata and how they relate to sedimentological processes and to global events.

Student Learning Objectives: Each student will demonstrate the ability to:

1. 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.
2. 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.
3. 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.
4. Illustrate, analyze and evaluate a stratified sediment or rock sequence; SLO #2 ... apply a diverse body of geologic information in the area of stratigraphy.
5. 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.
6. 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.

Homework:

There will be four take-home assignments given during the semester requiring independent research, critical thinking, and technical writing. Assignments will be given during class and will not be available on Blackboard. A due date will be given on the day homework is assigned. Late projects will be accepted at 50% of your earned point value by 6 pm. on the due date (including immediately after class); 25% value by the end of the following day, and 0% after that. Each homework assignment is worth about 8% of your total grade. If you are planning on missing class for a Sul Ross sanctioned event or other valid reason, homework must be turned in early (prior to the absence).

Exams:

There will be four exams covering sections discussed following the previous exam. These exams will comprise primarily short answer and essay questions. You may not use your notes for exams. Special arrangements will need to be made for make-up exams. Exams will be curved at the professor's discretion.

Field Trips:

An important component in stratigraphy and sedimentation is the ability to recognize and measure features in the field. There will be two required field trips during the semester: one to Big Bend National Park to measure and describe Cretaceous strata and another to road cuts of Oligocene conglomerate. The Big Bend field trip will require an overnight stay in the Park and some hiking. Each field trip will require a short field report, each comprising 10% of the total grade.

Grading System:**Points:**

4 Exams = 60% (15% each)

4 Homeworks = 20% (5% each)

2 Field Trip Reports = 20% (10% each)

Your grades will be recorded on Blackboard in the Grade Center.

Letter Grading: Final course grade will be based on a percentage of the total points as follows:

90.00-100% = A

80.00-89.90% = B

70.00-79.90% = C

60.00-69.90% = D

Less than 60.00% = F

Attendance and Make-up Policy:

The only acceptable excuses for missing class are those due to illness, approved Sul Ross sanctioned events, and observation of religious holidays. All excused absences **must** be documented on paper. Please inform the professor at least 1 week prior to missing class (e-mail, note on office door, etc...). With an appropriate excuse, you must make up missed quizzes/exams **within 10 days** of the last day of the absence or you have failed to meet your course responsibilities and will receive a zero.

University policy dictates that your instructor can drop you with an F from the course after 6 absences from MW classes.

Student athletes: You are given a full week to return the completed documentation: your progress (attendance and grade) to your coach, so when you present that card to me, I will take it and return it to you the following class period. Alternatively, you can bring it to my listed office hours and I will look up your progress then. I will not complete them at the beginning or end of class. No exceptions.

Classroom Conduct:

The Student handbook states under Student Misconduct, number 21, "Such prohibition includes disorderly classroom conduct that obstructs, interferes with, inhibits and/or disrupts teaching and/or classroom activities." Behavior which is included in this category: 1) persistent talking to ones' neighbors during lecture, 2) coming to class late or leaving early, 3) the use of cellular phones or MP3 devices in the classroom. **CELL PHONES MUST BE TURNED OFF IN CLASS.** This includes texting, emailing and social networking. *(If you are a member of an EMS/VFD group or have a child in day care and they must be able to reach you, let me know and we will discuss.)* Offenders of this policy will be asked once to stop and 5 points will be taken from their grade. If it occurs a second time, the offender will be instructed to leave the classroom, and there will be a meeting with the Dean of Student Life. If there are further incidents, UDPS will be called and offenders will be physically ejected from the classroom and will likely be expelled from the University.

CHEATING AND PLAGIARISM WILL NOT BE TOLERATED:

Any student caught cheating on an exam or quiz will receive an automatic **zero** on that assignment. If a student is caught cheating second time, additional disciplinary actions will be taken. Any student plagiarizing information on an assignment will receive an automatic zero for that assignment.

Students Needing Special Accommodations:

Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. If you have a disability, find out what your resources are: Students seeking accessibility services must contact Grace Petty in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is PO Box C-171, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203.

Lecture and Lab Schedule for the Fall 2019 Semester:

This calendar is subject to change with prior notice, at the instructor's discretion.

| Week of | Lecture Topics | Chapters | Lab |
|----------------|---|-----------------|---|
| Aug 26 | Intro to strat. & sed. | 1 | No lab |
| Sept 2 | Labor Day (no class 9/2) , Review of sed. rocks and minerals | 2 | Review of sed. rocks and mins. |
| Sept 9 | Types of sediment | 2,3 | Sand |
| Sept 16 | Sedimentary structures | 4 | Sed. Structures (part I) |
| Sept 23 | Exam 1 (9/23) , Alluvial fan deposits | 9 | Sed. Structures (part II) |
| Sept 30 | Stream deposits | 9 | Sieve Sed. Analysis |
| Oct 7 | Delta deposits, beach deposits | 12,13 | Lab Practical Exam, Shafter Field Trip (10/12) |
| Oct 14 | Estuarine deposits, shallow marine deposits | 13,14 | Isopach and Structural Contour Maps (part I) |
| Oct 21 | Deep marine deposits, Exam 2 (10/26) | 16 | Isopach and Structural Contour Maps (part II) |
| Oct 28 | Shallow marine carbonates | 15 | Permian Basin |
| Nov 4 | Stratigraphic principles, lithostratigraphy | 19 | Correlation (part I), |
| Nov 11 | Lithostratigraphy, biostratigraphy, Vets. Day (no class 11/11), Exam 3 (11/15) | 19,20 | Correlation (part II), BBNP trip (11/15-17) |
| Nov 18 | Biostratigraphy, Thanksgiving Holiday (no class 11/27-29) | 20 | No lab |
| Nov 25 | Biostratigraphy, subsurface stratigraphy | 20,22 | LAB FINAL EXAM, Thanksgiving Holiday |
| Dec 2 | Subsurface, sequence stratigraphy, Final Exam (12/6) | 22,23 | |