

SYLLABUS
Carbonates GEOL 4312
Fall, 2016
MWF 8:00-8:50 AM VIN 139

Professor: Dr. Fawn M. Last **Office:** 130 VIN **Phone:** 325-486-6987

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Office hours: Monday 9-10, 1-2; Thursday 1-2; Friday 9-10; or by appointment. When my door is open you are welcome to come by.

Required Text: James, Noel P and Jones, Brian. 2016 Origin Of Carbonate Sedimentary Rocks, Wiley 446.pp.

Other readings will be handed out in class, posted on Blackboard or put on reserve in the library.

COURSE CONTENT:

Carbonates are one of the most important classes of sedimentary rocks. They serve as reservoirs for oil, gas, and water, are critical in the biogeochemical cycling of Earth, and are important as records of biogenic evolution. In this course we will look at carbonates from the microscopic level to the macro level to evaluate their role in the sedimentary record through time. Students will learn how carbonate rocks form, how to identify carbonate rocks and their constituent components, characteristics of ancient and modern carbonate depositional environments, and how to evaluate carbonate deposits in the context of a sequence stratigraphic framework.

COURSE FORMAT and ATTENDANCE POLICY:

The format of the course during this academic session will be mainly lectures. Since there is no formal lab for this course, we will do some sample examination and hands on activities in class. A course web page for GEOL4312 will be maintained in Blackboard which will have images, web links and limited PowerPoint notes. You are expected to attend every class meeting and are responsible for all material presented/discussed. If you must miss a class, please contact me if you need help in obtaining assignments or notes.

FIELD TRIPS:

Two field trips are planned for this course. The first weekend field trip is being planned for October 13-16 to Carlsbad Caverns/Guadalupe Mountains. The second is on November 19 and is a one day trip to Caverns of Sonora. Details will be discussed in class.

LEARNING OUTCOMES:

- (1) To have a good working knowledge of modern carbonate sedimentary processes and depositional environments of carbonates and associated evaporites.
- (2) To have an understanding of post-depositional/diagenetic processes and resulting products (e.g., lithification, cementation, porosity, mineralogical alteration etc.).
- (3) To be able to evaluate carbonate sediments/rocks in the context of sequence stratigraphic variation on a regional scale and through geologic time.

Tests and a written term project will assess these outcomes.

EVALUATION AND GRADING:

Grades for this course will be determined on the basis of the following components:

- 2 Term Tests (each 20%); exact dates will be announced well in advance but are tentatively late September/early October and early November
- 1 Final Exam (20%); Dec 12, 8:00 AM- 10:00 AM
- 1 Term Paper/Annotated Bibliography (30%); Format requirements and due dates will be discussed in class and posted on Blackboard
- 1 field trip write-up (10%)

Tests/exams will cover material from lectures, in-class projects, assigned readings, field components, and AV programs. The tests are generally of a 'closed-book, short-answer' format and may include calculations.

LECTURE SCHEDULE:

Tentative Topics list. Please note: this schedule is subject to change

Weeks 1-5: Introduction to carbonate sedimentology; Why are we interested in "carbonates"? ; Chemical fundamentals (i.e., important stuff you forgot from Geochem 101); Carbonate geochemistry/crystal chemistry; Stable isotopes and carbonates; The carbonate factory (who's who?).

Weeks 6-10: Carbonate Depositional Environments/Facies: carbonate settings from deep marine through reef/platform to terrestrial environments; extraterrestrial carbonates.

Weeks 11-15: Diagenesis of carbonates; Porosity generation/destruction, Carbonate stratigraphy and carbonates through time.

COURSE WEBPAGE

<http://blackboard.angelo.edu> contains assigned readings, supplementary images and power point presentations, assignments, and grades.

Cell Phones and Other Electronic Devices

Cell phones must be turned off while in class. In addition, it is unacceptable to engage in text messaging during the class meeting time. If you are using any electronic devices other than a calculator (not your phone in calculator mode), a voice recorder, or a laptop computer to take notes, you may be asked by the instructor to leave the classroom for the remainder of the class period. The use of any electronic device not authorized by the instructor during a test may result in the forfeiture of your grade for that test. All electronic devices should be turned off and stored out of sight during tests.

Join GEO, AAPG, SEPM and IAS!

One of your most rewarding responsibilities as a Geoscience major or minor is the chance to participate in activities of GEO, our organization of geology students at ASU, and the major international 'sedimentological' geoscientific organizations: **AAPG** (American Association of Petroleum Geologists) and **SEPM** (Society for Sedimentology), and **IAS** (International Association of Sedimentologists). GEO is the ASU Student Chapter of AAPG and has regular supper meetings Wednesdays at 7:00 in VIN 139. The last Wednesday of each month we meet together with the San Angelo Geological Society and host a significant geology talk by an outside speaker. GEO dues are \$15.00/semester. AAPG student membership is free! To join AAPG fill out membership application at www.aapg.org (AAPG membership is strongly encouraged). Student memberships for SEPM and IAS are \$15/yr and €10/yr, respectively.

Know the ASU Honor Code

Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is contained in both print and web versions of the Student Handbook.

Our Honor Code reminds us that copying work of others or allowing others to copy your work is plagiarism. You will receive a zero for any assignment containing copied work. However, you can and should work with others.

Statement of Persons with disabilities

Persons with disabilities, which may warrant academic accommodations, must contact the Student Life Office, Room 112 University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

Statement of religious holy days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.