Fall 2018 Tentative Class Schedule  
Geol. 5315-003/6315-004 Carbonate Petrology and Depositional Systems  
Lecture: M & W 12:30 - 1:20pm Geological Sciences 320  
Lab: W 1:30 - 3:20pm Geological Sciences 320A

August 27 Monday  
Lec: Overview of class organization and research project; Intro. to CO₃ sedimentation.  
Readings:  

August 29 Wednesday  
Lec: Carbonate mineralogy & chemistry  
Readings:  
Milliman, J. D., 1974, Chapter 1- Carbonates and the ocean: In Marine Carbonates: New York, Springer-Verlag, p. 3-12.

Research Project: Tour of rock saw lab and demonstration of how to cut rock sample billets.

September 3 Monday – Labor Day - No classes at UTEP

September 5 Wednesday  
Lec: Carbonate precipitation-the subtidal CO₃ factory and precipitation rates.  
Readings:  

Lab 1: Determination of carbonate and commonly associated minerals in thin section and hand sample.  
Research Project: Look through samples and identify minerals in thin sections. Add to chart.

September 10 Monday  
Lec: Constituents of carbonate rocks - Skeletal grains (algae types; oncolites and stromatolites)  
Readings:  

September 12 Wednesday  
Lec: Constituents of carbonate rocks - Skeletal grains (invertebrates-molluscs, brachiopods, echinoderms, ostracodes and trilobites)  
Readings:  
Lab 2: Skeletal grains – cyanobacteria, algae, oncolites and stromatolites).  
Research Project: Identification of algae in thin sections. Add to chart.
**September 17 Monday**  
**Lec:** Constituents of carbonate rocks - Skeletal grains (invertebrates-corals & sponges)  
**Readings:**  

**September 19 Wednesday**  
**Lab 3:** Skeletal grains I (invertebrates-molluscs, brachiopods, echinoderms, ostracodes, trilobites)  
**Research Project:** Identification of invertebrates in thin section. Add to chart.

**September 24 Monday**  
**Lec:** Constituents of carbonate rocks - Skeletal grains (invertebrates-bryozoans, forams, misc)  
**Readings:**  

**September 26 Wednesday**  
**Lec:** Constituents of carbonate rocks - Non-skeletal grains (ooids and pisoids)  
**Readings:**  

**Lab 4:** Skeletal grains II (invertebrates-corals, sponges, stromatoporoids, bryozoans, forams, worm tubes, misc.)  

**October 1 Monday**  
**Lec:** Constituents of carbonate rocks - Non-skeletal grains (peloids and intraclasts)  

**October 3 Wednesday**  
**Lec:** Constituents of carbonate rocks - Carbonate mud (matrix) and the origin(s) of mud and identification of cement versus replacement spar  
**Readings:**  

**Lab 5:** Non-skeletal grains (oids, peloids, & intraclasts)  
**Research Project:** Identify non-skeletal grains. *Turn in computer-drafted measured section.*
October 8 Monday
Lec: Cement types and diagenetic setting
   Readings:

October 10 Wednesday
Lec: Carbonate diagenesis; Dolomite and dolomitization models.
   Readings:

Lab 6: Matrix mud, cements, and neomorphic and replacement spar.
Research Project: Demonstration of taking photomicrographs. Identify grain types, matrix, cements & estimate percentage of each in research samples. Add to chart.

October 15 Monday
Lec: Classification of carbonate rocks - Grabau, Folk, Dunham, Embry & Klovan; Porosity types and generation.
   Readings:

October 17 Wednesday
Lab 7: Classification of CO₃ rocks, porosity and dolomite.
Research Project: Classify research samples and write description of lithofacies.

October 22 Monday Lab Practical Exam scheduled for week of October 22
Lec: Ancestral Rocky Mountains Basins, Glacio-eustasy, Phylloid algal mound complexes
   Readings:

October 24 Wednesday
Lec: Carbonate Caprock: Piper Poe
   Readings:
   Caprock classification manuscript – Please write review of this.
Lab: Caprock Fabrics: Demonstration of different types
**October 29 Monday**

**Lec:** Carbonate depositional environments - profiles (ramp, rimmed margin/platform, offshore banks)

- Wilson, J. L., 1975, Chapt. 2- The stratigraphy of carbonate deposits; *in* Carbonate Facies in Geologic Time: New York, Springer-Verlag, p. 20-42

**October 31 Wednesday**

**Lec:** Tidal flat environment.

**Readings:**

**Lab 8:** Recognition of tidal flat facies assemblages and shallowing-upward cycles.

**Research Project:** *Hand-in classification of research samples, Table of sample characteristics, & lithofacies description.*

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**November 5 & 7 – No class GSA Annual Meeting in Indianapolis**

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**November 12 Monday**

**Lec:** Shelf environment.

**Readings:**

**November 14 Wednesday**

**Lec:** Bank margin environment.

**Readings:**

**Lab 9:** Thin section analysis of depositional facies of the Pennsylvanian phylloid algal mound complexes.

**Research Project:** Depositional facies analysis of research measured section.

**November 17 Saturday**

**Fieldtrip 1:** *Pennsylvanian bank margin phylloid algal mound complexes, Sacramento Mountains. Depart Geology Department parking lot at 8:00am and return by 5:00pm.*

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**November 19 Monday**

**Lec:** Shelf margin reef and forereef environment


**November 21 Wednesday – No class Thanksgiving break**
November 26 Monday
Lec: Slope, basin margin or toe-of slope, basinal environment in the Permian Delaware Basin.
Readings:

November 28 Wednesday
Lec: Sequence stratigraphy of carbonate platforms & Permian Reef Complex.
Readings:
Research Project: Write-up depositional facies descriptions and interpretation of depositional facies model for research section.

December 1 & 2 Saturday & Sunday
Field trip 2: Permian Reef Complex, Guadalupe Mtns/ Carlsbad Caverns. Examine depositional facies of Permian Reef complex. Study diagenetic alteration of reef system at Carlsbad Caverns. Depart Geology Department parking lot 7:30am, return to El Paso each day late afternoon around 5:30pm.

December 3 Monday
Lec: Lacustrine Carbonates, Brazilian and Angolan Pre-salt Lacustrine Systems
Readings:

December 5 Wednesday
Lec: Cool water carbonates? Heterozoan versus Photozoan biofacies associations
Readings:
Lab: Lacustrine and cool-water carbonate systems

December 10 Monday
Turn in carbonate research paper to Dr. Giles’s office by 1pm.