# Sedimentology GEOL 3425

**Richard Langford**  
915-747-5968  
Office GEOL 401B  
langford@utep.edu

**Office Hours** M-W 10:30-11:30  
Th 2:30-3:30

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**Text** Prothero and Schwab *Sedimentary Geology, 3rd Edition*

**Goals:** On completion of the class you should be able to:

1. identify and describe sedimentary rocks in field and hand specimen,
2. describe a stratigraphic section, correlate stratigraphy both in outcrop and the subsurface,
3. interpret depositional processes and depositional environments,
4. You should have a thorough understanding of the physics of sediment transport and how this is reflected in sedimentary rocks.
5. You should be able to interpret depositional environments from rocks.

I want you to be able to look at a rock and interpret the processes active based on the sedimentary structures, then interpret the environment based on the processes you infer.

**Methods:** There are three parts to this class.  
(1) Learning about sedimentology and stratigraphy in the lecture part of the class.  
(2) Learning practical field and laboratory skills. You must demonstrate a complete knowledge of sedimentary rocks and how to describe them. Much of this will be graded as pass-fail, either you do it or you don’t.  
(3) Application of class material and practical skills to solve field problems. The lab sections are devoted to a major field problem which you will write up as a paper.

**Grading:** Four Exams 60%; Labs and field Projects 25%; Final Project 15%

**Notes:** Read each chapter before attending the lecture on it. Take notes and ask yourself questions while reading. Attendance is not mandatory; however there are no make-ups for labs, field problems, or exams unless prior permission is obtained. Some laboratories may incorporate lectures.

**Graduate Student Requirements** – Graduate students are required to complete all of the assignments required of undergraduates and in addition must – 1) write 3 reports on field laboratory studies written in the style of professional journals and that include references from recent articles on the type of deposit studied. They are required to demonstrate a greater degree of understanding on the midterm and final exams and will be expected to score 5 points higher than the undergraduates for a comparable grade on each exam.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic / Laboratory</th>
<th>Assigned Reading</th>
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<tbody>
<tr>
<td><strong>Sediments and sedimentary rocks</strong></td>
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| **Week 1** | Intro to Class, What is sedimentology?  
Lab 1 - Sediment Textures  
Description of Sed Rocks, Describing a Strat Section  
Field Trip 1 Friday | Chapter 1, Chapter 5 |
| **Week 2** | Sedimentary Structures  
Siliciclastic Sediments  
Field Trip 2 - Sedimentary Structures  
Stokes Law, Bernoulli's eqn.  
The Physics of flow and particle movement, bed load and suspended load transport  
Lab 2 Sedimentary Structures | Chpt. 4, Chpt. 6, Chpt. 7, Chpt 3 |
| **Week 3** | Current flow and sed structures ripples, dunes, antidunes  
Lab 3 Clastic Sediments  
Test on Sedimentary Fabrics and Structures and Clastic Sedimentary Rocks | Chpt 2 cont. |
| **Week 4** | **Section 2 Physics of Sedimentation**  
Clastic Depositional environments. Environmental Analysis -- Waither’s Law, Facies Models  
FT - 3  Breaking out and Describing Facies | Chapters 8, 9, 10 |
| **Week 5** | Carbonate Rocks and Environments | Chpt 11, 12 |
| **Week 6** | Other Sedimentary Rocks | Chpt. 13, 14 |

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Section 3 Depositional Environments
<table>
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<tr>
<th>Week</th>
<th>Topic</th>
<th>Chapters and Readings</th>
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<td>8</td>
<td><strong>FT-4 Facies Analysis Bedforms in channels Field Trip,</strong></td>
<td>Chpt 9, to p. 306 Chpt. 10, 11 to p. 398</td>
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<td></td>
<td><strong>Second Exam Physics of Flow GSA, Vancouver 19-22</strong></td>
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<td>9</td>
<td>Coastal Deposition Marine Environments</td>
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<td>Fluvial and Eolian Deposition</td>
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<td>10</td>
<td>Deep sea and Carbonate deposition</td>
<td>Chpt 11 p. 398 to end, Chpt 12 Readings on final project</td>
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<td><strong>Field Trip-OCT 31,NOV 1,2 San Juan Basin and Northern NM</strong></td>
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<td><strong>Section 4 Stratigraphy</strong></td>
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<td>11</td>
<td>Lithostratigraphy/</td>
<td>Chpt 13</td>
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<td>12</td>
<td>Exam 3 on depositional Environments</td>
<td>Chpt 14</td>
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<td>Seismic Stratigraphy</td>
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<td>13</td>
<td><strong>Field Day. Intro To Final Project</strong></td>
<td>Chpt 17-18</td>
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<td>Seismic Stratigraphy LAB 5 Seismic Stratigraphy Lab/ <strong>Second field</strong></td>
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<td><strong>Trip Trip to Incio and Guadalupe mountains Nov 21,22,23</strong></td>
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<td>14</td>
<td>Seismic Stratigraphy Cont., Basin Analysis</td>
<td>Chapt. 19</td>
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<td>15</td>
<td>Last Exam <strong>Final Project Due Dead Day Friday Dec 5</strong></td>
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**Final Exam Monday Dec 8th 10:00-12:45**

**Supplies Needed**
- Colored Pencils
- Calculator
- 2 protractors
- 2 rulers with a metric scale
- Field notebook
- Marking Pen
- Sharp mechanical pencil
- Graph paper with a 1 cm grid
- Water bottles
- Hammer