

## Sedimentology GEOL 3425

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**Text:** *Principles of Sedimentology and Stratigraphy, Third Edition*, by S. Boggs Jr.

**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 last 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 or Final Exam 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.

	Date	Topic / Laboratory	Assigned Reading
<b>Sediments and sedimentary rocks</b>			
Week 1		Intro to Class, What is sedimentology? Sedimentary particles and textures, <b>Lab 1 – Sediment Textures</b>	p. xvii, p. 2, Chapt. 3
Week 2		<b>Labor Day Sept 1</b> Sedimentary Structures Siliciclastic Sediments Carbonate Rocks. Chemical and biological factors in sedimentology <i>FT 1-- Description of Sed Rocks, Describing a Strat Section</i>	Chpt. 4, Chpt. 5 Chpt 6, Chpt. 7
Week 3		<b>Lab 2 -- Sedimentary Structures</b> <b>Field Trip 2</b> <i>Describing a Strat Section</i>	
Week 4		Stokes Law, Bernoulli's eqn. The Physics of flow and particle movement, bed load and suspended load transport <b>Test on Sedimentary Fabrics and Structures and Sedimentary Rocks</b>	Chpt 2
<b>Section 2 Physics of Sedimentation</b>			
Week 5		<b>FT - 3</b> <i>Breaking out and Describing Facies</i>	Chpt 2 cont.
Week 6		Current flow and sed structures ripples, dunes, antidunes <b>Field Trip Friday, Sunday to San Juan Basin</b>	Chpt 2 cont.
Week 7		<b>FT 4</b> – Environmental Analysis-- Walther's Law, Facies Models	Chpt. 8

Section 3 Depositional Environments

Week 8	<b>FT-4 Facies Analysis Bedforms in channels Field Trip,</b> <b>Second Exam Physics of Flow</b>	
Week 9	Coastal Deposition Marine Environments Fluvial and Eolian Deposition <b>Field Trip 5</b>	Chpt 9, to p. 306 Chpt. 10, 11 to p. 398
Week 10	Deep sea and Carbonate deposition	Chpt 11 p. 398 to end, Chpt 12 Readings on final project

Section 4 Stratigraphy

Week 11	Lithostratigraphy/ <b>Field Trip to Indios or Sacramento Mtns and Guadalupe</b>	Chpt 13
Week 12	<b>Exam 3 on depositional Environments</b> Seismic Stratigraphy <i>Field Trip 6</i>	Chpt 14
Week 13	<b>LAB 5</b> Seismic Stratigraphy Lab/ <i>Tuesday 18<sup>th</sup> begin combined sed str project.</i>	Chpt 15
Week 14	Seismic Stratigraphy Cont.	To be announced
Week 15	<b>Lab 4</b> Sedimentary Petrology Lab <b>Last Exam</b>	

| Final Exam and Final Project Due 10:00-12:45 Thursday Dec 11th |

**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