

TEXAS A&M UNIVERSITY - CORPUS CHRISTI
COLLEGE OF SCIENCE AND TECHNOLOGY

GEOLOGY 4411 – SEDIMENTATION AND STRATIGRAPHY

Spring 2009

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Class Time and Place: Monday, Wednesday, and Friday, 9:00 a.m. – 9:50 a.m., CS 115.

Lab Time and Place: Monday, 12:00 – 2:00 p.m., CS 226.

Office hours

By appointment, or any time I am in my office and the door is open.

Location: NRC 3101

Course Description

Geology 3411 is an introduction to the study of sediments and sedimentary rocks. The course will address the description of sedimentary rocks in thin section, hand sample, and outcrop. Facies models and their use in interpreting the rock record will be addressed. The principles of sequence stratigraphy, biostratigraphy, and stratigraphic correlation will be presented. Lab exercises and field trips will provide a practical experience in understand the principles of stratigraphy and sedimentology.

Prerequisites

Prerequisites for this course are Physical (GEOL 1402) and Historical Geology (GEOL 1403).

Audience

Undergraduate students in Geology and Environmental Sciences

Student Learning Outcomes

This course is designed to

- develop an understanding of the evolution of stratigraphy and sedimentology over the past 500 years.
- gain a solid understanding of basic stratigraphic principles including sequence stratigraphy
- develop an understanding of the processes of sedimentation and the mechanisms of sediment transport
- gain an practical understanding of sedimentological facies and how to recognize them in outcrops and cores
- develop skills to describe and interpret hand specimens, hand samples, outcrops, and cores of sedimentary rocks
- relate rock textural, mineralogical, and chemical processes to underlying physical and chemical principles
- gain a working knowledge of the terminology of sedimentology and stratigraphy

Required Texts

Sandstone Depositional Environments (Required)

Author: Scholle and Spearing (eds.)

Publisher: AAPG Memoir 31

ISBN: 0-89181-307-1

Sandstone Facies Models Response to Sea Level Change (Required)

Author: Walker and James (eds.)

Publisher: Geological Association of Canada

ISBN: 0-919216-49-8

Siliciclastic Sequence Stratigraphy in Well Logs, Cores, and Outcrops (Required)

Author: Van Wagoner, Mitchum, Campion, and Rahmanian (eds.)

Instructional Methods and Activities

Students are expected to demonstrate a large degree of independence in mastering the subject of this course. Attending the lecture will be one component to achieve this goal. Equally important components include reading the relevant textbook chapters prior and after they have been discussed in class, note taking during lecture, study of on-reserve items in the library, and working the home work problems. Students should therefore be prepared to devote considerable outside-of-class time to course work. A traditional rule of thumb is three hours outside of class spent in reading and preparation for each class hour.

Attendance policy

Attendance on a regular basis will be essential to the successful completion of the course. There is no provision for making up late and/or missed work. It is your responsibility to obtain notes and announcements from fellow students in the event you miss a class.

Evaluation and Grade Assignment

Grade break-down is as follows:

Midterm 25%

Class participation 5%

Lab assignments and exams 25%

Field trip reports 20%

Final 25%

No extra credit. Lab and lecture exams are separate.

I encourage you to work together for the purpose of mastering the general techniques taught in lab. However, what you turn in to be graded should be your own. Always, show how you obtained your results.

Lab assignments

Labs are due on the date specified on the lab assignment, usually at the beginning of next week's lab. Labs late by up to one week are -30%. More than one week late: no credit.

University policies

By enrolling in this course you agree to follow university policies as stated in the Course Catalog and in the Student Handbook, including policies concerning student conduct, integrity and honesty, and special needs. The use of cell phones is not allowed in class.

Drafting and Lab Supplies

The lab exercises (and partially the lectures) will require the use of some basic drafting supplies. Please bring these items with you to each lab session. A small tackle box has been proven useful to keep your supplies at hand.

Mechanical pencil, lead size of 0.5 mm or finer

Black ink pen/felt pen with very fine tip (e.g. Sharpie ultra fine point)

Ruler with cm/mm markings

Eraser. Get a good one!

Calculator

Hand lens

Notebook

Clipboard

Hand lens

Schedule of Topics (subject to change)

Lecture

Week 1,	Introduction and Examination of the History of Sedimentology and Stratigraphy
Week 2,	Origin of Sediments
Week 3,	Classification of Clastic Sedimentary Rocks
Week 4,	Fluid Transport of Sediments
Week 5,	Fluvial and Lacustrine Sedimentation and Facies
Week 6,	Deltaic Sedimentation and Facies
Week 7,	Shoreline Sedimentation and Facies
Week 8,	Aeolian Sedimentation and Facies
Week 9,	Classification of Carbonate Rocks
Week 10,	Carbonate Sediments and Carbonate Depositional Systems

Mid-term

Week 11,	Evaporite Depositional Systems
Week 12,	Sea-level Changes and its Effects on Depositional Systems
Week 13,	Incised Valley Deposits
Week 14,	Depositional Sequence Stratigraphy
Week 15,	Depositional Sequence Stratigraphy

Final examination

Lab

Lab topics will correlate closely with lecture topics and provide practical exercises to illustrate and complement the lecture material