

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

GEOL 5324 – Clastic Shoreline Sedimentology and Benthic Ecology
FALL SEMESTER 2008

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Lecture Day and Time: Friday 2:00 p.m. to 3:40 p.m. CS 110

Course Description

This graduate-level course is for coastal and marine systems science and environmental science majors, who would like a better understanding of the basic principles of modern shoreline depositional systems and sedimentology and the eco-systems associated with them and the preservation of these systems in the rock record. The course will examine modern depositional systems exposed along the Texas Gulf coast and their benthic invertebrate ecology. The class will consist of classroom lectures and 6-7 days of field trips, in the area between Galveston, Texas and Baffin Bay.

Participants should be prepared to make short hikes, travel in boats, and occasionally enter the waters of the Gulf and the back barrier bays and lagoons. Proper clothing and footwear for these types of excursions are essential and required.

Prerequisites: Graduate standing, Physical Geology (or equivalent), Sedimentation and Stratigraphy (or equivalent) or permission of the instructor

Course Goals and Objectives

Upon completion of this course, the participant should be able to:

- (1) utilize the basic principles of clastic sediment transport and deposition
- (2) utilize the facies concept of deposition systems in interpreting the rock record
- (3) apply the basic concepts and models of modern clastic aeolian, fluvial, deltaic, and shoreline depositional systems in interpreting the rock record
- (4) identify the basic bedforms and sedimentary structures in the field.
- (5) utilize the factors controlling clastic sediment deposition in developing geologic facies models
- (6) describe and interpret clastic sedimentary structures in the field
- (7) utilize the knowledge of preservation potential of shoreline deposits in interpreting the rock record
- (8) utilize the basic principles of depositional sequence stratigraphy in interpreting the rock record

- (9) identify the major burrowing and trace-making benthic invertebrates and their ecological niches
- (10) identify the ichnogenera of the major traces produced by clastic shoreline benthic invertebrates
- (11) utilize the basic principles of ichnology in interpreting the rock record

Evaluation and Grade Assignment

Grades will be based on:

- A) A research paper on a topic relevant to the course (20% of grade).
- B) Participants will design a virtual field trip (30% of grade) to be submitted one week before the conclusion of the course. (This assignment can be submitted to the instructor as a 30 minute PowerPoint presentation or as a html web-ready documents (virtual field trips).)
- C) Participants will conduct a field research project (40% of grade) to be submitted one week before the conclusion of the course. (This assignment can be submitted as a Word document or as a pdf file.)
- D) Participants will make a ten minute summary PowerPoint presentation of their research project (10% of grade)

Class Policies

Attendance of all field days and lectures is mandatory. While group discussion and collaboration is encouraged during the trip, unless work is explicitly specified to be a team project, the work you hand in is expected to be yours. Please note that alcohol and drug policies are strictly enforced. Violations will result in immediate expulsion and a failing grade.

Textbooks

Sandstone Depositional Environments

Author: Scholle and Spearing (eds.)

Publisher: AAPG Memoir 31

ISBN: 0-89181-307-1

Sandstone Facies Models Response to Sea Level Change

Author: Walker and James (eds.)

Publisher: Geological Association of Canada

ISBN: 0-919216-49-8

The Sedimentology, Neoichnology, and Preservation Potential of Primary Deltaic and Associated Secondary Shoreline Beach and Barrier Island Depositional Facies (Field Trip Guidebook) (Required)

Author: Garrison (ed) (downloadable from website)

Other relevant research and technical papers will be provided as needed

Supplies

Field notebook, pencils, camera, camping equipment

Lectures

Fluid Transport of Sediments

Fluvial Depositional Systems

Deltaic and Associated Shoreline Depositional Systems

Depositional Sequence Stratigraphy

Basics of Ichnology and Benthic Ecology

Field Excursions:

North Padre Island Aeolian Systems

North Padre and Mustang Barrier Islands

Ingleside Barrier, Nueces Bayhead, and Indian Point

Brazos River Delta

Cedar Lakes and San Luis Pass Tidal Deltas