

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

Geochemical Assessment of Subsea Engineering –
ESCI 4490 and ESCI 5490/CMSS 6490
Department of Physical & Environmental Sciences

MONDAY OCTOBER 24 – FRIDAY OCTOBER 28, 08:00 am-05:00 pm

A. COURSE INFORMATION

Course number/section: ESCI 4490 and ESCI 5490/CMSS 6490

Class meeting time: Daily 0800-1700, blocks scheduled according to students needs

Class location: NRC1004

B. INSTRUCTOR INFORMATION

Instructor: Dr. Richard B. Coffin

Office location: 103 Harte Research Institute

Office hours: On request via email

Telephone: 361.825.2456

e-mail: richard.coffin@tamucc.edu

Appointments: Brief email or call

C. COURSE DESCRIPTION

This course is designed for students in the NORTEX program (www.nortexpetroleum.org/) with an industrial student focus, upper level undergraduate students in CHEM and ESCI with a coastal energy exploration focus and graduate students in ESCI and CMSS. Education will involve geochemical assessment of subsea engineering related to energy mining and carbon sequestration with a focus on environmental impact and platform and pipeline stability. Lectures will include resource characterization. Focus over the 5 days includes:

1. Introduction to subsea platform and environmental issues.
2. Introduction to marine geochemistry with a focus on light isotope geochemistry.
3. Petroleum seepage assessment.
4. Gas diffusion and advection studies.
5. Environmental impact and platform stability.
6. Carbon sequestration.

D. PREREQUISITES AND COREQUISITES

CHEM 1411/1412, and GEOL 1403 and ESCI 3351 or permission of instructor

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Readings, peer review literature, and presentations are available on line or will be provided at Black Board.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is critical for instructors and students to help improve learning. We will use our assessment protocol to provide continuous development of this NORTEX – TAMU-CC course. Expected student learning from this course are listed below to provide students with needed information for efficient learning as well as instructors information needed for further information and presentation of the course topics. With completion of this course, students will be conversant with the influence of subsea mining influence on deep ocean and shallow sediment ecology, coast stability, and mining platform security. Specifically students will be able to:

1. Demonstrate knowledge of basic information on application of light isotope geochemistry to study coastal ocean ecosystems.
2. Demonstrate understanding of approaches to interpret isotope geochemistry in terms of anthropogenic influence on the ecosystem.
3. Demonstrate familiarity with environmental and platform stability issues related to subsea engineering.
4. Be able to discuss application of geochemical evaluation of environmental impact and monitoring pipeline and platform stability in terms of methane and petroleum diffusion and advection.
5. Demonstrate familiarity with developing activity related to deep ocean CO₂ sequestration.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

This course will primarily consist of an interactive lecture, where the professor will present information through various media, text books, published literature, web sites and presentations. Students will be asked to participate in lectures by discussing various topics and attempting to synthesize them in manner that leads to a deeper understanding of subsea systems. There will also be field trip to local petroleum industry on course related topics.

H. MAJOR COURSE REQUIREMENTS AND GRADING

This class will have 2 exams and three quizzes. Exams will be the third and fifth day of the class with the final on the fifth day. Quizzes will be at the end of the first, second and fourth day lectures. All quizzes and exams will focus on class room lectures and field trips. Quizzes will account for 20% of the grading, third day exam will cover 30%, participation will account for 10%, and final exam 40%. Exams for graduate and undergraduate credit will be different with a more thorough academic challenge for graduate exams. *See section K for Writing and Participation rubrics.*

I. COURSE CONTENT/SCHEDULE

Each unit covers one 8 hour day.

Unit 1 – Introduction

Unit 2 – Petroleum Seepage Assessment

Unit 3 – Gas Diffusion and Advection Studies

Unit 4 – Environmental Impact and Platform Stability

Unit 5 – Carbon Sequestration

J. COURSE POLICIES

Attendance/Tardiness - All lectures and field trips are mandatory. University policy will determine the consequences for excessive absences.

Make-up Exams & Late Work - We will be going over homework in class the day it is due. Therefore, it will only be accepted with a valid Drs. note. Make-up exams also require a Drs. note and will be administered at 7:30 am in the professor's office within 2 school days of the actual exam.

Extra Credit - No extra credit is planned for this course. However, this may change at the discretion of the professor and students will all have equal opportunity for points.

Cell Phone Use - NO. There is no tolerance for receiving, sending, talking or texting on a cell phone.

Laptop Use - Only for note taking. I will require you to turn off WIFI if it becomes a distraction

Food in Class - You may eat or drink so long as it does not become a distraction for other students. However, please refrain from consuming smelly foods. If you bring food that is particularly tasty, please consider bringing enough for everyone.

Participation - Required and 15% of your final grade. Participation will include, but is not limited to engaging in classroom discussion, problem solving, asking questions and most importantly not being disruptive.

Conduct - During class you may find that your ideas, opinions and past experiences conflict with others or what is presented during lecture. Please be respectful of these alternative views and help to ensure an engaging and courteous classroom atmosphere.

K. GRADING RUBRICS

Levels of Participation - This rubric will be used to determine the "Participation" grade in this class. Participating is a matter of active engagement, rather than passive observation, and is shown through working effectively in diverse groups and teams, as well as through cooperation and respect for others. Participation quality in this course will be evaluated using the features defining the four levels shown below.

Level 1 Participation (Low)

- Little or no advance preparation
- Lets others set and pursue the agenda
- Observes passively and says little or nothing
- Responds to questions
- Gives the impression of wanting to be somewhere else
- Attendance record is haphazard and inconsistent; may be absent or late without notice

Level 2 Participation (Mid-Low)

- Moderately prepared in advance
- Takes some part in setting group goals and agendas
- Participates in discussions, letting others provide the direction
- Occasionally introduces information or asks questions
- If likely to be absent or late, informs others ahead of time and arranges to cover own Responsibilities

Level 3 Participation (Mid-High)

- Well prepared in advance
- Takes a large part in setting group goals and agendas
- Actively participates in discussion and asks questions
- Listens actively and shows understanding by paraphrasing or by acknowledging and building on others' ideas
- Volunteers willingly and carries own share of the group's responsibilities

Level 4 Participation (High)

- All of the markers of proficient participation, plus:
- Draws out ideas or concerns of others, especially those who have said little
- Re-visits issues or ideas that need more attention
- Helps the group stay on track
- Summarizes group decisions and action assignments

L. COLLEGE AND UNIVERSITY POLICIES

• **Academic Integrity (University)** - University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one's own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

• **Classroom/Professional Behavior** – Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

• **Statement of Civility** - Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)** - The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (<http://www.tamucc.edu/academics/calendar/>) for the last day to drop a course.
- **Grade Appeals (College of Science and Engineering)** - As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at <http://sci.tamucc.edu/students/GradeAppeal.html>. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.
- **Disability Services** - The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.
If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.
- **Statement of Academic Continuity** - In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.