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

Geochemical Assessment of Subsea Engineering – CHEM/ESCI/CSMM ####
Department of Physical & Environmental Sciences
Spring 2018
April 23-27, 2018

A. COURSE INFORMATION

Course number/section: CHEM 4490/ESCI 4490 and CHEM 5490/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, Mr. Tony Wood
Office location: 103 Harte Research Institute
Office hours: On request via email
POC: Richard B. Coffin
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 CSMM. 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, GEOL 1403, ESCI 3351

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 continues 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 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 learn:

1. Basic information on application of light isotope geochemistry to study coastal ocean ecosystems.
2. Approaches to interpret isotope geochemistry in terms of anthropogenic influence on the ecosystem.
3. Environmental and platform stability **i**ssues related to subsea engineering.
4. Application of geochemical evaluation of environmental impact and monitoring pipeline and platform stability in terms of methane and petroleum diffusion and advection.
5. 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 Geochemistry/Geophysics Overview
Unit 2 – Petroleum Seepage/Gas Diffusion and Advection
Unit 3 – Well Platform Stability
Unit 4 – Environmental Impact and Platform Stability – Coast Guard Overview
Unit 5 – MSRC Field Tour

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 UNIVERSITIY POLICIES
• Academic Integrity (University) - It is expected that university students will demonstrate a high level of maturity, selfdirection, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior. See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity
• Classroom/Professional Behavior –
• 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 by University deadlines that depend on when this course is conducted. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must submitted. After the deadline a student will not be allowed 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 - Disability Services (DS) is the hub for coordinating services and accommodations to ensure accessibility and utilization of all programs for all Texas A&M University-Corpus Christi students with disabilities. Our services are designed to meet the

unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individual's documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office at 116 Corpus Christi Hall or go to ttp://disabilityservices.tamucc.edu/

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.