I. COURSE: CHEM 5490 Advanced Topics (3 semester credit hours, lecture only)

II. INSTRUCTOR: Dr. Xinping Hu; Email: Xinping.Hu@tamucc.edu (Science Lab #2, Tel: 3395)

III. COURSE DESCRIPTION

This course will cover both chemical processes in the oceanic environment and how biology, geology and physics affect the chemistry. Topics include air-sea interactions, water column chemistry, and reactions in sedimentary environments. Students are expected to participate in the teaching process through their involvement in small groups, class discussions, and modeling/simulation exercises. Prerequisite: CHEM 1311, CHEM 1312, or permission of instructor.

IV. TEXTBOOK


Reference books:

There will also be some extra reading materials.

V. STUDENT LEARNING OUTCOME

Upon successful completion of this course, students will be able to:

• Demonstrate understanding of the biological/physical/chemical/geological controls on seawater chemistry
• Use stable and radioactive isotopes in studying biogeochemical cycles
• Explain how sediment geochemistry affects biogeochemical cycles in the ocean
• Demonstrate understanding of the interaction between ocean and climate
• Identify and critically examine a major issue in chemical oceanography

VI. COURSE PREREQUISITES, REQUIREMENTS, & GRADING CRITERIA

Prerequisites: CHEM 1311, CHEM 1312, or permission of instructor.

Requirements:
• The student is expected to be on time and attend every class. If absent, it is the responsibility of the student to obtain missed information from a classmate. Missed information includes not only lecture notes, but also any possible information regarding syllabus changes. The student is expected to arrive on time prepared to take notes and work on in-class problems with pen or pencil, paper, calculator and colored markers/pencils.
The class schedule is a tentative guide to the material we will be covering during the semester. Individual lectures may change if extra time is needed to cover certain topics.

- The student is required to write a term paper (15 page double spaced with up to 20 references) including the following sections: Abstract, Introduction, Discussion, Conclusion, Future Research, and Reference Cited. A journal template of the student’s choice should be chosen to format the term paper (both main text and bibliography) on a topic relevant to chemical oceanography and give a semester-end presentation on this paper.

**Grading Criteria**

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Homework assignments</td>
<td>10%</td>
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<td>Quizzes</td>
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<td>Mid-term exams (two)</td>
<td>40%</td>
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<td>Final exam</td>
<td>20%</td>
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<td><strong>Term paper and presentation</strong></td>
<td>20% (10% each)</td>
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<td><strong>Total</strong></td>
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**Disabilities Accommodations**

Disability Services is located in Corpus Christi Hall 116 (825-5816). Should you need special consideration for exams and/or class activities (special microphones, additional time for exams, enlarged exams, etc.), please contact this office. The university will provide assistance as needed, but you must contact Disability Services to make arrangements. The instructor cannot make modifications without their involvement. Should you have mobility problems, please notify the instructor and TA so that they may seek assistance for you in the case of fire drills or emergencies.

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 or visit Disability Services.

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.

**CLASS SCHEDULE**

- Week 1 – Introduction
- Week 2 – Major element geochemical cycles – part I
- Week 3 – Major element geochemical cycles – part II
- Week 4 – Nutrients, primary production
- Week 5 – Organic matter
- Week 6 – Dissolved gases – O₂ - **Mid Term I on Feb 26**
- Week 7 – Dissolved gases – CO₂ – part I
- Week 8 – Spring break – no class
- Week 9 – Dissolved gases – CO₂ – part II
- Week 10 – Trace elements in the ocean
- Week 11 – Stable isotopes – **Mid Term II on Apr 2**
- Week 12 – Radioactive isotopes
- Week 13 – Redox equilibrium
- Week 14 – Sediment biogeochemistry
- Week 15 – Global nutrient and carbon cycle and climate change – part I
- Week 16 – Global nutrient and carbon cycle and climate change – part II
Week 17 – Final Exam – May 14

VII. ACADEMIC CONDUCTS AND GRADE APPEAL

Class Standards: The student is expected to be on time and attend every class. If absent, it is the responsibility of the student to obtain missed information from a classmate. Missed information includes not only lecture notes, but also any possible information regarding syllabus changes. The student is expected to arrive on time prepared to take notes and work on in-class problems with pen or pencil, paper, calculator and colored markers/pencils.

Before you enter the lecture hall turn OFF your cell phone! Beepers must also be turned off or put on silent mode. Electronic interruptions will NOT be tolerated!

Class Conduct: All students are expected to follow proper classroom behavior and treat the other students and the instructor with respect. If a student’s actions or behavior is deemed disruptive to the class by the instructor, the student will be asked to leave the class for that day.

Academic Integrity and Honesty: All students are expected to conform to college-level standards of ethics, academic integrity, and academic honesty. By enrolling in this course, you agree to be bound by the Regulations and Procedures published in the TAMU-CC STUDENT CODE OF CONDUCT. Group interactions, investigations, and studying are encouraged; however, duplicative work will be treated as cheating and will receive a grade of zero. Anything that is viewed as cheating on an exam will be given the most severe penalty possible, most likely an "F" for the course, but may include more severe punishments.

In choosing to take this course, you are agreeing to abide by the course rules, regulations, and standards. This includes agreeing to be respectful to your instructors and fellow students. Conduct that is disruptive or disrespectful will not be tolerated and is grounds for dismissal from the class. Should you have concerns or questions, you are to discuss them with the instructor as soon as possible. However, you are bound by these rules, regulations, and standards from the first day of the class throughout the duration of the course.

Use of Electronic Devices during Exam: Any use of an electronic device (Tablet, Cell Phone, MP3 player, CD player, computer) during an exam is strictly prohibited. Any use of such a device will be considered an attempt to cheat on the exam and will result in a 0 on the exam although more severe actions may be considered. Calculators may be allowed on exams when needed, but only for mathematical operations. The use of programmable calculators to store or retrieve information during an exam will be considered an attempt to cheat on the exam. Also, if a calculator is discovered to have saved programs or information that could be used as an unfair advantage on the exam, this will be considered an attempt to cheat on the exam. Programs or operators that aid in mathematical operations such as a quadratic equation calculator may be used.
GRADE APPEALS
A student who 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 on 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 on the process, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, consult Texas A&M University-Corpus Christi University Procedure 13.02.99.C2.01 Student Grade Appeal Procedures (http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage (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 or the College of Science and Engineering Dean’s Office.