Chemical Oceanography CHEM 5362
Department of Physical and Environmental Sciences
Spring 2018

A. COURSE INFORMATION
   Course number/section: CHEM 5362/001
   Class meeting time: TR 3:30-4:45 pm
   Class location: CS 103
   Course Website: http://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION
   Instructor: Xinping Hu
   Office location: Science Lab #2 Room 104
   Office hours: TR 10:30 am -12:00 pm
   Telephone: 825-3395
   e-mail: Xinping.Hu@tamucc.edu
   Appointments: By request

C. COURSE DESCRIPTION
   Catalog Course Description
   The study of the oceans and seas as a chemical system, including interactions with both the biota and the solid earth.

   Extended 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.

D. PREREQUISITES AND COREQUISITES
   Prerequisites
   CHEM 1411, CHEM 1412, or permission of instructor.

   Corequisites
   None.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
   Required Textbook(s)
   None

   Optional Textbook(s) or Other References
There will also be some extra reading materials.

Supplies
None.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

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

G. INSTRUCTIONAL METHODS AND ACTIVITIES

The course is given by face-to-face lectures augmented with PowerPoint slides. Sample problems are presented frequently. Students will be called upon to answer questions. Attendance will be taken. There will be two in-class exams and a final exam.

H. MAJOR COURSE REQUIREMENTS AND GRADING

The student is required to write a term paper (15 page double spaced with up to 20 references) that includes 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. A final presentation on the term paper is also required.
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>60</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10</td>
</tr>
<tr>
<td>Homework</td>
<td>10</td>
</tr>
<tr>
<td>Term Paper and Presentation</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 Jan 17</td>
<td>Introduction 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 2 Jan 22</td>
<td>Major element geochemical cycles – part I</td>
<td>1/24, Last day to register class</td>
<td></td>
</tr>
<tr>
<td>Week 3 Jan 29</td>
<td>Major element geochemical cycles – part II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 4 Feb 5</td>
<td>Nutrients, primary production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 5 Feb 12</td>
<td>Organic matter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 6 Feb 19</td>
<td>Dissolved gases – O$_2$ – Mid Term I (Feb 23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 7 Feb 26</td>
<td>Dissolved gases – CO$_2$ – part I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 8 Mar 5</td>
<td>Dissolved gases – CO$_2$ – part II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 9 Mar 12</td>
<td>Spring break – no class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 10 Mar 19</td>
<td>Dissolved gases – CO$_2$ – Part III, Stable isotopes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 11 Mar 26</td>
<td>Stable isotopes, Radioactive isotopes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 12 Apr 2</td>
<td>Radioactive isotopes – Mid Term II (Apr 4)</td>
<td>4/6, Last day to drop class</td>
<td></td>
</tr>
<tr>
<td>Week 13 Apr 9</td>
<td>Redox equilibrium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 14 Apr 16</td>
<td>Sediment biogeochemistry and Trace Metals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 15 Apr 23</td>
<td>Global nutrient and carbon cycle and climate change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 16 Apr 30</td>
<td>Review and Graduate Student Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final Exam – (May 10, 1:45-4:15 PM)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
J. COURSE POLICIES

Attendance/Tardiness
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.

Late Work and Make-up Exams
There will be no make-up exams for this class. If you miss one lecture exam, your final exam grade will be counted twice to replace the missed exam. If you miss more than one exam, you will receive a zero for the second missed exam. Certain university-related circumstances may warrant a makeup exam with prior notification, documentation, and arrangements. Do not show up late to an exam; no student will be admitted to the exam after the first exam-taker has left.

Extra Credit
Up to 10 points will be added to each exam (100 points)

Cell Phone Use
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.

Laptop Use
Laptops are to be used only for lecture material. Use of laptops for non class items will not be permitted.

Food in Class
Generally, food in class is not permitted during class. It is permissible to bring appropriate snacks during the 2 1/2 hour final exam. Coffee, sodas, energy drinks are permissible.

Missed Exam
See Late Work and Make-Up Exams above.

Participation
Students are expected to attend all classes and be prepared to ask and/or answer questions. Pop quizzes are given to assess mastery of material and as an indication of attending class.

Student Responsibility
It is the student’s responsibility to read and be aware of the contents of this syllabus and the course website on Blackboard. Announcements and changes are communicated in
the classroom, Blackboard, and/or emails.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, 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**
  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 the 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 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 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 statue 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. My office is a Veterans Green Zone office. If you need to talk, come and see me.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **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.

L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**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.