GEOL-4411.001 Sedimentation and Stratigraphy  
Department of Physical and Environmental Sciences  
Fall 2019

A. COURSE INFORMATION

Class number/section: GEOL 4411.001 (lecture); GEOL 4411.101 (lab)  
Class meeting time: T.R. 09:30-10:45 am (lecture); R. 02:00-03:50 pm (lab)  
Class location: CS 226 (lecture and lab)  
Course website: Blackboard  http:// Bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Jennifer Smith-Engle (lecture)  
Office location: NRC 3502  
Office hours: M. 09:30 am-12:30 pm, W. 09:30-11:30 am  
Telephone: (361) 825-2436  
e-mail: Jennifer.Smith-Engle@tamucc.edu  
Appointments: Additional hours available by appointment.

Lab Instructor: Ryan Turner  
e-mail: rturner@tamucc.edu

C. COURSE DESCRIPTION

Catalog Course Description  
Composition and origin of sediments and sedimentary rocks. Description and classification of rocks in hand specimen. Principles of stratigraphy, including stratigraphic units and correlation. Facies models for major depositional systems. Field trips. Prerequisites: GEOL 1403, GEOL 1404, GEOL 3411 (may be taken concurrently) and GEOL 3442, or permission of instructor. Corequisite: SMTE 0094 Geology Laboratory Safety Seminar required every semester for lab-based courses. The Safety Seminar must be completed before the Census Date of the semester to participate in the lab portion of this course.

Extended Course Description  
This course will introduce students to the fundamental principles used in sedimentology and stratigraphy. This will include a focus on processes that influence the formation, transportation, and deposition of sediments and sedimentary rocks. We will be learning about the composition and origin of sediments and sedimentary rocks including the description and classification of rocks in hand specimen. Principles of stratigraphy, including stratigraphic units and correlation will be used to put strata in a context of time and space. There will be a required field trip and fieldwork.
Most of the Earth’s crust (that which we see exposed) is of sedimentary origin and sedimentary rocks contain the majority of the world’s petroleum and natural gas. These rocks may contain fossils or sedimentary structures that can indicate much about the ancient environments in which they were formed, and thus inform about Earth’s geologic history including global climate, tectonic processes, and even sea level change. Our goal for this course is to develop your skills at observing, collecting, analyzing, and interpreting evidence both in the laboratory and out in the field. After first studying sedimentary processes and sedimentary rocks, we will study stratigraphy, or the study of rock layers or strata and use what we learn in a practical, hands on project where we will combine sedimentological and stratigraphic principles to analyze and describe a real life example in the field.

Expected Skills
This is a senior level class and you will be expected not only to memorize, but to apply, analyze, and synthesize information. In this class, you will be expected to be familiar with the format and style of writing a scientific report and scientific lab reports. You must have the geologic information that you learned in your previous geology courses readily available. These may include but will not be limited to: reading a geologic map and describing its geologic history, familiarity with the main rock forming minerals and basic sedimentary rocks, knowledge of the three main plate margins and typical rocks found there, ability to do basic mathematics and unit conversions, etc. In order to do well in this class, you are expected to attend all lectures and labs, to come prepared with chapters read ahead of time, and to put a significant amount of time (approximately 2 hours for each hour of class or lab time) independently reading, studying, and preparing materials.

D. PREREQUISITES AND COREQUISITES
Prerequisites: GEOL 1403, GEOL 1404, and GEOL 3411 (may be taken concurrently), or permission of instructor.
Corequisites: SMTE-0094 Geology Lab Safety Seminar

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook(s)

Read the assigned chapters prior to the class in which the material will be discussed, and stay current with the reading.

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. Identify, classify, and describe siliciclastic, chemical, biogenic and other sedimentary rocks in hand sample and thin section;
2. interpret the possible depositional environment for a given sedimentary rock sample or outcrop using the sedimentary characteristics such composition, texture, and structures;
3. develop hands-on experience with some of the tools of sedimentological study such as sediment description and grain size analysis;
4. be able to correlate stratigraphy, and interpret various stratigraphic sequences, correlation diagrams, or outcrops;
5. predict what types of sedimentary processes and stratigraphy might be expected at various tectonic settings and develop a reasonable hypothesis about sediment supply, transport, deposition, subsidence and/or base level;
6. develop and improve critical thinking skills, communication, scientific report writing, and professional geological skills.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

We will use a variety of instructional methods in this course, including lecture, laboratory, and a field trip. You will have large projects as well as and be asked to write a scientific paper that will pull together many of the concepts that you have learned in this course. Much of your work will be done outside of the classroom via a field trip or on your own time. In class, be curious and ask questions. This shows maturity and a desire to learn. Disciplined notetaking is required for any science. Taking good notes in class ensures that you know what will be expected in assignments, quizzes, and formal examinations.

H. MAJOR COURSE REQUIREMENTS AND GRADING

The student learning outcomes described in Section F will be measured through the assignments listed below.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>POINTS</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Exams (3 @ 100 points each)</td>
<td>300 points</td>
<td>30%</td>
</tr>
<tr>
<td>Lecture Chapter Quizzes (5-8 @ 10-15 points each)</td>
<td>100 points</td>
<td>10%</td>
</tr>
<tr>
<td>Lab assignments</td>
<td>475 points</td>
<td>47.5%</td>
</tr>
<tr>
<td>Field Trip and write up (Strat Column/Report)</td>
<td>125 points</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
A perfect score in this course would be to earn all 1000 points available (1000 points earned/1000 possible points = 100%). Final grading will be as follows: \( A = 895-1000 \) points; \( B = 795-894 \) points \( C = 695-794 \) points \( D = 595-694 \) points \( F <595 \) points. Based on student effort and improvement shown throughout the semester, the instructor may adjust upward the letter grade assigned to a particular numerical score.

### I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>LECTURE TOPIC</th>
<th>LECTURE CHAPTER(S)</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T. 8/27</td>
<td>Class Introduction. Weathering and Soils</td>
<td>Chapter 1-2</td>
<td>Lab #1 - Grain Size Analysis by Sieving</td>
</tr>
<tr>
<td>2</td>
<td>T. 9/03</td>
<td>Topic cont’d.</td>
<td>Chapter 3</td>
<td>Lab #2 - More on Sediment Texture</td>
</tr>
<tr>
<td></td>
<td>R. 9/05</td>
<td>Sedimentary Structures</td>
<td>Chapter 4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>T. 9/10</td>
<td>Topic cont’d.</td>
<td>Chapter 4</td>
<td>Lab #3 - Petrographic Study of Sandstones</td>
</tr>
<tr>
<td></td>
<td>R. 9/12</td>
<td>Sandstones and Conglomerates</td>
<td>Chapter 5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>T. 9/17</td>
<td>Mudrocks.</td>
<td>Chapter 6</td>
<td>Lab #4 - Sandstones, Conglomerates and</td>
</tr>
<tr>
<td></td>
<td>R. 9/19</td>
<td>Siliclastic Diagenesis</td>
<td>Chapter 7</td>
<td>Breccias: Study of Hand Samples</td>
</tr>
<tr>
<td>5</td>
<td>T.09/24</td>
<td>Topic cont’d.</td>
<td>Chapter 7</td>
<td>Lab – Field Trip Prep: Intro. to Jacob</td>
</tr>
<tr>
<td></td>
<td>R. 9/26</td>
<td>Terrestrial Sedimentary Environments</td>
<td>Chapter 8</td>
<td>Staff, Strat. Column Description (no</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>assignment)</td>
</tr>
<tr>
<td>6</td>
<td>T. 10/01</td>
<td>Lecture Exam 1 (Ch. 1-7)</td>
<td></td>
<td>Lab #5 – Mudrocks: Study of Hand Samples</td>
</tr>
<tr>
<td></td>
<td>R. 10/03</td>
<td>Topic cont’d</td>
<td>Chapter 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sat. 10/05</td>
<td>Field Trip to Hill Country (one day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>T. 10/08</td>
<td>Coastal Environments</td>
<td>Chapter 9</td>
<td>Lab – Field Trip Project: Stratigraphic</td>
</tr>
<tr>
<td></td>
<td>R. 10/10</td>
<td>Topic cont’d</td>
<td>Chapter 9</td>
<td>Column / Report</td>
</tr>
<tr>
<td>8</td>
<td>T. 10/15</td>
<td>Clastic Marine and Pelagic Environments</td>
<td>Chapter 10</td>
<td>Lab #6 – Composition of Carbonate</td>
</tr>
<tr>
<td></td>
<td>R. 10/17</td>
<td>Topic cont’d</td>
<td>Chapter 10</td>
<td>Sediments</td>
</tr>
<tr>
<td>9</td>
<td>T. 10/22</td>
<td>Carbonate Rocks</td>
<td>Chapter 11</td>
<td>Lab #7 – Carbonate Rocks:</td>
</tr>
<tr>
<td>Date</td>
<td>Section</td>
<td>Chapter</td>
<td>Topic</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>10/24</td>
<td>Carbonate Environments</td>
<td>12</td>
<td>Study of Hand Samples</td>
<td></td>
</tr>
<tr>
<td>10/29</td>
<td>Biogenic Sedimentary Rocks</td>
<td>13</td>
<td>Lab – Videos on Carbonate Environments (no assignment)</td>
<td></td>
</tr>
<tr>
<td>10/29</td>
<td>Chemical Sedimentary Rocks</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/05</td>
<td>Lecture Exam 2 (Ch. 8-12)</td>
<td></td>
<td>Lab #8 Misc. Sed. Rocks: Study of Hand Samples</td>
<td></td>
</tr>
<tr>
<td>11/07</td>
<td>Lithostratigraphy</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/12</td>
<td>Biostratigraphy</td>
<td>16</td>
<td>Lab #9 Fence Diagrams</td>
<td></td>
</tr>
<tr>
<td>11/14</td>
<td>Geophysical and Chronostratigraphic Correlation</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/19</td>
<td>Geochronology and Chronostratigraphy</td>
<td>18</td>
<td>Lab #9 Fence Diagrams cont’d</td>
<td></td>
</tr>
<tr>
<td>11/21</td>
<td>Topic cont’d.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/28</td>
<td>NO CLASS: THANKSGIVING</td>
<td></td>
<td>NO LAB: THANKSGIVING</td>
<td></td>
</tr>
<tr>
<td>11/29</td>
<td>Sedimentary Rocks in Space and Time</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/03</td>
<td>Last class. TBA.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/05</td>
<td>NO CLASSES: READING DAY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/12</td>
<td>Lecture Exam 3 (Ch. 13-19) – 08:00 AM</td>
<td></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.

**J. COURSE POLICIES**

**Attendance/Tardiness**
You are expected to attend all labs and remain in lab during your entire lab period. There are no make-up labs. Mineral identification is part of the lab, but most of your hand sample study may occur after lab hours. You are expected to bring your textbook to the laboratory as a reference for lab activities. Most laboratory instruction cannot be conveniently repeated outside of the scheduled laboratory time. Therefore, attendance at your assigned lab session is required.

**Late Work and Make-up Exams**
Work is due by the stated deadlines. The grade for late work will be reduced by up to 20% for each day it is late. Exams may be made up only in cases of an excused absence and students should contact the instructor in advance to make prior arrangement if
possible.

**Cell Phone Use**
The instructor does not prohibit but discourages the use of electronic communication
devices such as cell phones (texting, etc.) during class because they distract other
students from the learning experience. Please place such devices in silent mode during
class. If you must answer an emergency call, please walk unobtrusively out of the class,
finish the conversation, and return to your seat equally unobtrusively.

**Laptop Use**
You are welcome to bring a laptop or other device to class with the presumption that you
are using it to facilitate your own learning (take notes, research an issue, etc.). The use
of laptops for other uses is discouraged as it distracts from the learning experience.

**Food in Class**
Students’ schedules may be hectic and may not allow time between classes for meals. If
consuming food and drink in the lecture classroom, please respect the facilities by
cleaning up all spills immediately and removing all trash. No food or drink is allowed in
the lab room (CS-226). Drinks may be kept outside the lab room at your discretion.

**Missed Exam**
Students who must miss an exam should contact the instructor in advance to make
arrangements to make up the missed exam. If the absence is unplanned, you should
contact the instructor as soon as possible about the situation. Students who miss an
exam or pop quiz due to excused absence may make it up. Exam and quiz makeups
should be completed as soon as possible.

**Participation**
Students are encouraged to actively participate in lecture discussion. Generally, students
who participate more actively are able to learn the material more effectively and earn a
higher grade in this class.

**K. 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)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. **Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.** Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/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](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](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.

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.

I. **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.