GEOL 4411 Sedimentology and Stratigraphy
Department of Physical and Environmental Sciences
Spring 2018

A. COURSE INFORMATION

Course number/section: GEOL-4411.001 (lecture), GEOL-4411.101 (lab)
Class meeting time: TR 8:00 – 9:15 AM (lecture), R 10:00 – 11:50 AM (lab)
Class location: BH 202 (lecture), CS 226 (lab)
Course Website: http://Bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Erika Locke
Office location: CI 214 or CS 126
Office hours: Tuesday/Thursday 12:30 – 1:30 pm or by appointment
Telephone: (713) 823-2701
e-mail: Erika.Locke@tamucc.edu
Appointments: Please email instructor for an appointment. I encourage you to contact me via email with any questions or concerns you may have.

C. COURSE DESCRIPTION

Catalog 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 required field trips and fieldwork.

Extended Course Description
Most of the Earth’s crust (the rocks 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 tell us a lot about the ancient environments in which they were formed, and thus give those who study them information 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. During the second half of the semester we will be studying 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.
D. PREREQUISITES AND COREQUISITES

Prerequisites
GEOL 1403, GEOL 1404, GEOL 3411 (may be taken concurrently) and GEOL 3442, or permission of instructor.

Corequisites
SMTE 0094

Expected Skills
In this class, you will be expected to have familiarity 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, being familiar with the main rock forming minerals and basic sedimentary rocks, having knowledge of the three main plate margins and the rocks you might find there, being able to do basic mathematics and unit conversions, etc. In order to do well in this class, you will be expected to attend class and lecture and put a significant amount of time (approximately 3-4 hours for each hour of class time) outside of class studying and preparing materials.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Supplies You will need a hand lens (10x-14x magnification range – can be found on Amazon), a metric ruler, colored pencils, a scientific calculator or equivalent phone/tablet app, and a computer (or flexibility to use school computer lab facilities). You will be provided with a grain size chart – always bring it, your hand lens, calculator, and ruler to class!

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.
The main goal of this course is to provide you with a comprehensive knowledge of sedimentology and stratigraphy, with practical, hands-on experience while developing the skills of observation and critical thinking. We will be doing this at various scales, from small scale features such as grain size, color, degree of rounding, composition, sedimentary structure, etc to larger scale geometries when we look at the stratigraphy of a vertical sequence of rocks. Keeping this in mind, the successful student will:

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

1. Identify, classify, and describe siliciclastic, chemical, biogenic and other sedimentary rocks using both the “naked eye” and hand lens and possibly even the microscope;

2. Interpret the possible depositional environment for a given sedimentary rock sample or outcrop using the sedimentary characteristics such as composition, texture, and structures;

3. Develop hands-on experience with some of the tools of sedimentological study such as sediment core retrieval, sediment core logging and 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.

I want all of you to succeed in this course. I would be thrilled if by the end of this course you were able to interpret sedimentary strata in an effectual way and to be able to explain why it is important to be able to do this. I define "effectual" as being able to walk up to an unknown outcrop, or to be given a graphical depiction of some sedimentary strata, and use critical thinking to make observations and interpretations to come up with a reasonable and well-thought-out hypothesis about the environment in which the rocks were formed.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

This class meets five hours weekly and will include lecture, laboratory, and field trips. You will have large projects as well as and be asked to write a scientific paper that will pull together the concepts that you have learned in each of these environments. Much of this work will be done outside of the classroom via field trips or in 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 following indicates the assessment tools will be used to determine your grade in the class.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams* - 3 @ 10% each</td>
<td>30 %</td>
</tr>
<tr>
<td>Quizzes - ~ 5 @ 2 % each</td>
<td>10%</td>
</tr>
<tr>
<td>Homework, class, lab, and field trip assignments</td>
<td>25%</td>
</tr>
<tr>
<td>Attendance and Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Field trips and write ups</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

*The exams may include lecture, lab, or field trip material. Assignments will have different weighting depending on the difficulty and time and effort involved in completing them. Late assignments will not be accepted. All assignments will be evaluated using the grading guidelines outlined below. As you can see from this rubric, A or B work requires significant effort and understanding.

**90-100%**
Put in more effort than required to complete the assignment; no grammatical/spelling errors (if a write-up is required); work is neat and professional; includes superior and abundant supporting materials (data, examples, figures, etc), computations done correctly (if calculations are necessary), work is easy to follow; clearly understands the main point; contains unusually insightful or in-depth description or analysis.

**80-90%**
Put in significant effort to complete the assignment; no grammatical/spelling errors (if a write-up is required); work is neat and professional; includes abundant supporting materials (data, examples, figures, etc), computations done correctly (if calculations are necessary), work is easy to follow; clearly understands the main point; shows a degree of insight and effort beyond the average, and goes beyond minimum required for the assignment.

**70-80%**
Put in just enough effort to complete the assignment; minor grammatical/spelling errors (if a write-up is required); solid job with supporting materials, work is neat and professional; computations done correctly (if calculations are necessary), but work is difficult to follow or too general in some places; appears to have understood the main point, but some doubt remains in my mind.

**60-70%**
Didn't quite complete the assignment as outlined; multiple grammatical/spelling errors (if a write-up is required); work is somewhat sloppy and unprofessional; missing or incomplete supporting materials; computations incorrectly done (if calculations are necessary); evidence suggests that the main point was mostly missed.

0-60%

Assignment essentially incomplete or does not answer the question; many grammatical/spelling errors (if a write-up is required); failure to provide supporting material; work is sloppy and unprofessional; computations incorrectly done or not answered (if calculations are necessary); little evidence that the main point was understood.

1. COURSE CONTENT/SCHEDULE

The tentative schedule is given in the table below. Be aware that these dates are subject to change.

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16</td>
<td>Class introduction – Weathering and Soils</td>
<td>Chapter 1-2</td>
</tr>
<tr>
<td>1/18</td>
<td>Clastic Transport and Fluid Flow</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>1/23</td>
<td>Topic Cont. Lab #1</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>1/25</td>
<td>Sedimentary Structures</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>1/30</td>
<td>Topic cont. Lab #2</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>2/1</td>
<td>Sandstones and Conglomerates</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>2/6</td>
<td>Mudrocks Lab #3</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>2/8</td>
<td>Siliciclastic Diagenesis</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>2/13</td>
<td>Topic Cont. Lab #4</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>2/15</td>
<td>Exam 1 (Ch. 1-7)</td>
<td></td>
</tr>
<tr>
<td>2/20</td>
<td>Terrestrial Sedimentary Environments Lab #5</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>2/22</td>
<td>Topic Cont.</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>2/27</td>
<td>Coastal Environments Lab #6</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>3/1</td>
<td>Topic Cont.</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>3/6</td>
<td>Clastic Marine and Pelagic Environments Lab #7</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>3/8</td>
<td>Topic Cont.</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>3/10-18</td>
<td>Spring Break – no classes</td>
<td></td>
</tr>
<tr>
<td>3/20</td>
<td>Carbonate Rocks</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
<td>Chapter</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>3/22</td>
<td>Carbonate Environments Lab #8</td>
<td>12</td>
</tr>
<tr>
<td>3/27</td>
<td><strong>Exam 2 (Ch. 8-12)</strong></td>
<td>12</td>
</tr>
<tr>
<td>3/29</td>
<td>Field Trip Project Lab #9</td>
<td></td>
</tr>
<tr>
<td>4/3</td>
<td>Biogenic Sedimentary Rocks</td>
<td>13</td>
</tr>
<tr>
<td>4/5</td>
<td>Field Trip Project Lab #10 Last day to drop 04/07.</td>
<td></td>
</tr>
<tr>
<td>4/10</td>
<td>Chemical Sedimentary Rocks</td>
<td>14</td>
</tr>
<tr>
<td>4/12</td>
<td>Lithostratigraphy Lab #11</td>
<td>15</td>
</tr>
<tr>
<td>4/17</td>
<td>Biostratigraphy</td>
<td>16</td>
</tr>
<tr>
<td>4/19</td>
<td>Geophysical and Chemostratigraphic Correlation Topic Cont. Lab #12</td>
<td>17</td>
</tr>
<tr>
<td>4/24</td>
<td>Geochronology and Chronostratigraphy</td>
<td>18</td>
</tr>
<tr>
<td>4/26</td>
<td>Topic Cont. Lab #13</td>
<td>18</td>
</tr>
<tr>
<td>5/1</td>
<td>Sedimentary Rocks in Space and Time</td>
<td>19</td>
</tr>
<tr>
<td>TBA</td>
<td>*full day field trip to Austin</td>
<td></td>
</tr>
<tr>
<td>5/4</td>
<td><strong>Reading Day</strong></td>
<td></td>
</tr>
<tr>
<td>5/8</td>
<td><strong>Exam 3 (ch. 13-19) 8:00 – 10:30</strong></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 and Participation**

Attendance and arriving on time, with all needed materials is important. We will often break out to work in groups and if you are late this is very disruptive. Students who attend class learn and retain information at much higher rate than those that don’t so—attend! Attendance will be a portion of your 10% participation grade.

**Late Work and Make-up Exams**

Work is due by the stated deadlines. No late work accepted past due date. Exams may be made up only in cases of an excused absence (documented death in the family, hospitalization, etc.) and students should contact the instructor in advance to make prior arrangement if possible. No makeup for quizzes.

**Extra Credit**

There may occasionally be extra credit questions on quizzes or tests. There may be one or more opportunities for extra credit assignments.

**Cell Phone Use**

Please silence and put away cell phones. Distraction, annoyance, or nuisance by the use
of any device will be addressed immediately by the instructor and the student will have the option of discontinuing its use or exiting the classroom (resulting in a recorded absence). Cellphones should be silenced. No phone conversations are allowed in class.

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 not allowed as it distracts from the learning experience.

Food in Class
Food and beverages of any type and any form are not permitted in lab settings - this is a TAMU System-wide policy. You may bring drinks into lecture, just make sure to clean up after yourself.

Missed Exam
Students who must miss an exam due to an excused absence (documented hospitalization, death in the family, significant illness, etc.) 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 due to an excused absence and provide documentation, may be able make it up. Exam makeups should be completed as soon as possible.

Participation
Participation is important!!! Curiosity, a good attitude, a willingness to learn, and participation on field trips and in class discussions is critical to your success as a student (and in everything else you do!) You don’t always have to get everything ‘right’ but you will be expected to try your best and be involved. Ask questions, discuss things with your classmates, be present. Because I feel that these traits are so important, they will account for 10% of your grade.

Safety – Labs and Field Trips
You will be required to take the mandatory SMTE 0094 Geology Lab Safety Seminar, a corequisite online class that you were required to register for along with this class. You should complete the SMTE 0094 online course BEFORE our first lab session on January 26th.
On field trips it is up to you to dress appropriately and be ready for the elements. Appropriate shoes (hiking boots or tennis shoes), pants, hat, sunglasses, sunscreen, bug spray, etc. are critical. We will get sandy and/or muddy so dress accordingly.
Field trips are part of the fun of geology and help us apply what we have learned in class, but please keep in mind that our behavior off-campus reflects back on the Geology Program and the University as a whole. So have fun but be wise – not otherwise!

Academic Honesty
There will be a lot of opportunities in this course for teamwork and collaboration. That said, assignments, lab write-up, reports, etc. should be produced by you independently.
Copying others work or sharing computer files, etc. is considered academic dishonesty and I am obligated to report it. If at any point in class you have questions about what independent work means please ask. TAMUCC provides us with software that can help us uncover plagiarism, and again if I see it I must report it. Please be aware of what constitutes plagiarism. You can read about plagiarism at http://www.plagiarism.org/plagiarism-101/what-is-plagiarism/.

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/) for the last day to drop a course.

It is hoped 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 your professor, 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. Simply stopping attendance and participation WILL NOT automatically result in being dropped from the class. 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](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/](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.