GEOLOGY 3442 - GEOMORPHOLOGY

Department of Physical and Environmental Sciences
Fall 2017

A. COURSE INFORMATION

Course number/section: GEOL 3442-001
Class meeting time: Lecture MWF 10:00 – 10:50 am, Lab F 11:00-12:50 pm
Class location: Lecture – Bay Hall 201/ Lab – CS226
Course website: Blackboard http://Bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Erika Locke
Office hours: The instructor will be available to meet with students 15 minutes before, or 15 minutes after, each class meeting or Thursday 2:00 to 3:10 pm (by appointment) in CI 214
Telephone: (713) 823-2701
e-mail: Erika.Locke@tamucc.edu
Appointments: Additional hours available by appointment. Please email instructor directly for an appointment.

C. COURSE DESCRIPTION

Catalog Course Description
An introduction to the geologic study of modern Earth surface landforms, and the processes and mechanisms by which they are formed.

Extended Course Description
Geomorphology will provide an in-depth investigation of the processes that determine the form and evolution of landscapes. Geomorphology is a broad topic that has relevance across many disciplines including hydrogeology, environmental sciences, civil planning, pedology, and archaeology to name a few. In this course we will be analyzing landscapes and their processes from the macro- to continental-scale develop an understanding of the broad nature of this discipline. Through a series of hands-on labs and a semester-long Analysis Project, you will work on practical skills that will be useful in your other science courses and in your careers as scientists (or otherwise!)
D. **PREREQUISITES AND COREQUISITES**

GEOL 1403 or permission of the instructor. SMTE 0094 is a co-requisite for this course and documented completion of this course early in the semester is required.

E. **REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES**

**Required Textbook(s)**

**Supplies**
Pencil, eraser, colored pencils, ruler with mm markings, protractor, scientific calculator or phone/tablet app, and personal computer.

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

Upon completion of this course, the successful student will:
1. develop a broad and varied understanding of the major geomorphological processes and mechanisms that shape the Earth’s surface, and the landforms and landscapes they produce;
2. expand your skills of observation! So much of learning any science is your ability to observe, describe, measure, analyze, and develop interpretations;
3. practice and refine practical skill that will serve you in a science career. These skills will include hands on labs, scientific report writing, reading technical papers and discussing them, critical thought, observation, collection, analysis, and interpretation of data;
4. work as a productive member of a team and be able to communicate an understanding of geomorphic concepts and theories to peers and others.

G. **INSTRUCTIONAL METHODS AND ACTIVITIES**

This course will include both lecture and laboratory. Laboratory activities will include map and air photo observation and analysis, hands-on experiments, and field trips where you will make your own observations and collect data for analysis. These exercises will help support you as you work on your Analysis Project and prepare to present it to your peers. We are scheduled for 5 hours weekly of class time (one hour of which may be online), and it is expected that a commitment of a considerable time outside will be necessary to student success.

**MAJOR COURSE REQUIREMENTS AND GRADING**

The student learning outcomes described in Section F will be measured through the assignments listed below. Limited extra credit opportunities may be made available.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>POINTS</th>
<th>% of FINAL GRADE</th>
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2
### Class, lab, and field trip assignments
- 300 points  
  - 30%

### Quizzes
- 50 points  
  - 5%

### Participation and Attendance
- 50 points  
  - 5%

### 2 exams @ 100 pts each
- 200 points  
  - 20%

### Comprehensive Final Exam
- 150 points  
  - 15%

### Analysis Project Report first and final drafts
- 200 points  
  - 20%

### Analysis Project presentation
- 50 points  
  - 5%

### Total
- 1000 points  
  - 100%

All point totals above are approximate and may vary.

### H. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
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</thead>
<tbody>
<tr>
<td>M 09/04</td>
<td>Labor Day Holiday – NO CLASS</td>
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<tr>
<td>W 09/06</td>
<td>Class intro, syllabus, History of Geomorphology</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>F 09/08</td>
<td>Processes and Forces</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>W 09/13</td>
<td>Chemical Weathering and Soils</td>
<td>Chapter 3</td>
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<tr>
<td>F 09/15</td>
<td>Topic Cont.</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>W 09/20</td>
<td>Mass movement and slopes</td>
<td>Chapter 4</td>
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<tr>
<td>F 09/22</td>
<td><strong>Field Trip #1 – weathering rates at OBC</strong></td>
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<tr>
<td>M 09/25</td>
<td>1-page Analysis Project intended focus summary due by 10:00 pm. Schedule meeting time with instructor between 09/27 and 10/02 to discuss.</td>
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<tr>
<td>W 09/27</td>
<td>Topic Cont.</td>
<td>Chapter 4</td>
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<tr>
<td>F 10/29</td>
<td><strong>Exam 1 (Ch. 1-4)</strong></td>
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<tr>
<td>M 10/02</td>
<td>Meet with instructor on Analysis Project between 11:30-3 if you have not already.</td>
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<tr>
<td>W 10/04</td>
<td>Drainage Basins</td>
<td>Chapter 5</td>
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<tr>
<td>F 10/06</td>
<td>Topic Cont.</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>W 10/11</td>
<td>Fluvial Processes</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>F 10/13</td>
<td>Fluvial Landforms</td>
<td>Chapter 7</td>
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<tr>
<td>Day</td>
<td>Date</td>
<td>Topic/Activity</td>
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<tr>
<td>W</td>
<td>10/18</td>
<td>Coastal Geomorphology</td>
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<td>F</td>
<td>10/20</td>
<td>Topic cont.</td>
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<tr>
<td>W</td>
<td>10/25</td>
<td>Aeolian Processes and Landforms</td>
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<tr>
<td>F</td>
<td>10/27</td>
<td>Field Trip #2 Coastal Geomorphology</td>
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<tr>
<td>W</td>
<td>11/01</td>
<td>Topic Cont.</td>
</tr>
<tr>
<td>F</td>
<td>11/03</td>
<td>Exam 2 (Ch. 5-8 and 13)</td>
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<tr>
<td>W</td>
<td>11/08</td>
<td>Glaciers and Glacial Mechanics</td>
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<tr>
<td>F</td>
<td>11/10</td>
<td>Glacial Erosion and Deposition and Periglacial Processes</td>
</tr>
<tr>
<td>W</td>
<td>11/15</td>
<td>Karst and Cave Processes</td>
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<tr>
<td>F</td>
<td>11/17</td>
<td>Topic Cont.</td>
</tr>
<tr>
<td>W</td>
<td>11/22</td>
<td>Analysis Project Student Presentations</td>
</tr>
<tr>
<td>F</td>
<td>11/24</td>
<td>NO CLASS: THANKSGIVING</td>
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<tr>
<td>W</td>
<td>11/29</td>
<td>Analysis Project Student Presentations</td>
</tr>
<tr>
<td>F</td>
<td>12/01</td>
<td>Analysis Project Student Presentations</td>
</tr>
<tr>
<td>W</td>
<td>12/06</td>
<td>Catch up and Review</td>
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<tr>
<td>W</td>
<td>12/13</td>
<td>Final Exam 8:00 – 10:30</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor.

The exams are cumulative but mostly focused on the material covered since the previous exam. Material from lecture, lab, fieldtrips, assigned papers, or any other aspect of the course may be on the exam.

On field trip days we may be combining lecture and lab into one block of time from 10 to 12:50.

**Analysis Project Report and Presentation**

One quarter of your class grade will come from your semester-long Analysis Project and Presentation. This project will allow you to apply the geomorphologic knowledge that you have gained during the semester and put it to use in a hands-on manner. You will be expected to start on this early and to put in a significant amount of effort, creativity, and time to complete it.

The main deliverable from this project will be an eight-page paper, plus an appendix with figures, data tables, graphs, maps, and bibliography to support your work. To help guide you in this process there will be a series of graded checkpoints throughout the semester, the dates of which are listed in the course schedule.
Also, throughout the semester we will be reading and discussing journal articles by other geomorphic researchers which may help you to define what you want to do for your project. I want to be clear that your paper will not be the typical summary of someone else’s research. While you will glean ideas from these articles and reference them in your work, the majority of this report will be on geomorphic data that you collect, produce, and measure, along with your own analysis and interpretation of that data. Our field trips throughout the semester will help you to develop your Analysis Project.

While this may seem a little intimidating at first, field studies can be really fun and you tend to learn more when you are developing the research than just reading about some else’s. The key to success is to find a theme to focus on, start early, and be prepared for the eventual set backs that are a normal part of any successful scientific research. With hard work and careful planning, you will do great!

Some examples of topics one might focus on, but are by no means limited to, include:

- a regional-scale correlation between landforms, lithology, structure, climate, etc.
- a stream profile or network analysis
- a comparison analysis between similar geomorphic environments, but from different locations; for example, you could look at coastal geomorphology along the TX coast vs. someplace else.
- an analysis of landscape hazards, for example, slope failures or flooding potential, based on air photos, topo maps, DRGs (digital raster graphics) or similar
- an analysis of historical landscape change via air photos and topo maps, esp. obvious in coastal environments or due to river channel migration
- a comparative morphometric study of some particular geomorphic feature like glacial drumlins in different regions (or perhaps even the same region)
- a comparative analysis of a certain geomorphic features from areas with differing climates
- for the intrepid/curious/motivated, hands-on field- or lab-based projects are a possibility; for example, you could:
  - undertake a small, monitoring study to examine sand dune migration rates or beach profiles over a couple of months
  - compare/contrast soil profile development at a few locations either by digging small trenches, or using preexisting cuts
- examine abrasion rates ("erosion") as related to lithology; for example, you could use entrance way steps on buildings of known age, but of differing construction material

- examine the angle of repose or strength of a sediment under differing conditions (wet/dry, changing overburden, etc.)

- replicate and speed up a weathering process like insolation (say via a campfire), to see how it effects materials of differing lithology

As I mentioned these are just some ideas, but all require that you be proactive and start early!

I. COURSE POLICIES

Attendance/Tardiness and Participation
Your attendance and participation is expected. Arriving on time, with all needed materials will be critical. 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 5% participation grade. These may be the easiest points to score so take advantage of it. I will randomly take attendance but with a class this small, I know who is and isn't there consistently.

If you have a University approved reason for missing a class (sports team travel, etc.) contact me well in advance to make arrangements. If your absence is an emergency ie. death in the family, hospitalization, etc. also let me know as soon as possible. I am not unreasonable but you will need documentation and know that our definitions of “emergency” may vary.

Positive participation in class (and life!) is important, so participate! Speak up, ask questions, help out when needed. Again, this helps you toward the easiest 5% of your grade and increases the learning experience for everyone. You may volunteer or be asked to do extra on field trips such as take notes or photos or compile data and upload to blackboard for all to use. My suggestion is to volunteer early and often as these may be good opportunities for extra credit.

Participation also includes note-taking. Many studies have shown that good note-taking practices can lead to better course outcomes and improved retention beyond the course’s conclusion. This has certainly been my own experience and my observation is that my A students take notes. For more information on this topic see, https://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/
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 a documented excused absence (remember this is at the discretion of the instructor) and students should contact the instructor in advance to make prior arrangement if at all possible. No makeup for quizzes, labs, or in-class assignments.

Extra Credit
There may occasionally be extra credit questions on quizzes or tests. There may be one or more opportunities for extra credit assignments or from participation in class (see above under participation).

Cell Phone Use
The instructor highly 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 not allowed.

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.

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.

Communication by Blackboard and Email
There may be times when I will post announcements on Blackboard, especially around project or field trip times. Please check the announcement page of blackboard and your islander.tamucc.edu email once per day so you don’t miss anything important.
I. 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. If you believe that this behavior is occurring toward you or another student please come to me right away.

- **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
• **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.
• Related Issues
  There is a reliance on technology in this course that impacts the need to have assignments completed on time. Having ample time to complete an assignment will be the responsibility of the student. It is also the student’s responsibility to find solutions to technical problems with sufficient time to complete the required tasks. Do not wait until a due date is near to discover/report lack of access to software, inability to connect to a network, etc. It is not the instructor’s responsibility to provide technical support. Technical help can be accessed by calling the IOL Helpdesk at (361) 825-2692 or submit a request via email to iol.support@tamucc.edu.

J. 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.