PRELIMINARY SYLLABUS
GEOL 4411 SEDIMENTATION AND STRATIGRAPHY
SPRING 2012

GEOL 4411 Sedimentation and Stratigraphy  Instructor:  Dr. Mark Besonen
Spring 2012  Office:  HRI 103
Lecture:  MW, 2:00 – 3:15 pm  Phone:  x2043
CI 128  E-mail:  mark.besonen@tamucc.edu
Lab:  W, 12:00 – 1:50 pm  Office Hrs:  M, 11:00 – 2:00 pm
CS 226  W, 10:00 – 12:00 pm
or by appointment
Course Web Page:  under Blackboard 8 branch of The Island Online (https://iol.tamucc.edu/)

Course Description: Much of what we know about the Earth’s history (especially at the surface where we live!) has been deduced from sedimentary rocks and deposits. The study of these rocks and deposits is essentially a forensic, detective science in which we make observations and collect evidence to interpret geologic history and past environments at many different temporal and spatial scales. Our goal for the course is to develop your skills at observing, collecting, analyzing, and interpreting sedimentary evidence both in the field and laboratory. Towards the second half of the semester, we’ll trend into topics related to stratigraphy, building on our sedimentology base to understand “bigger picture” dynamics. We’ll finish off the semester with a practical, hands-on project to pull much of our sedimentology and stratigraphy together with a real life example from a local sedimentary environment.

Student Learning Outcomes: Our primary goal in this class is to provide you a broad background in sedimentology and stratigraphy, but from a practical point of view. The simple, macro-observable properties of a sedimentary rock (e.g. color, composition, texture, sedimentary structures, flow indicators, stratification style, etc.) provide powerful evidence to interpret past processes and events near the surface of the Earth. This is especially true when these simple characteristics are integrated with an understanding of the vertical sequence, and large scale geometry and distribution of a deposit. We can adjust and refine these interpretations even further with various analytical techniques in the lab. And while there, we can even take our observations down to the microscopic level for additional evidence. Keeping this in mind, by the end of the semester, the successful student will:

1.) be able to identify and classify siliciclastic, biogenic, chemical, and other sedimentary rocks using both “naked eye” and “hand lens”-observable sedimentary characteristics such as texture, composition, and structures;
2.) be able to interpret probable environment(s) of deposition for a given sedimentary rock sample or outcrop;
3.) be familiar with basic laboratory tools, analyses, and techniques to augment evidence when “naked eye” observations are not sufficient;
4.) feel comfortable with interpreting (or at least making an educated guess at!) the “big picture” geologic history for a region based on the sedimentary record found there; and, finally,
5.) continue to improve and refine professional geological skills, especially critical communication/presentation skills such as scientific report writing.
**Our Text and Readings:** Prothero and Schwab (2003) is our main text, and required reading. It should be available at the campus bookstore, but I’ve provided the full reference below in case you want to find it elsewhere. Supplementary materials may be distributed during the semester.


Please keep an eye out for mistakes as you read through the text, and we’ll send our list of bugs to the authors at the end of the semester so the next edition is hopefully better!

**Grading Breakdown:** The breakdown for class grades is as follows:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>Mixed class, lab, and field trip assignments and quizzes [throughout entire semester]</td>
</tr>
<tr>
<td>5%</td>
<td>Participation [see important “Attendance/Absence and Tardiness” section below]</td>
</tr>
<tr>
<td>15%</td>
<td>Exam #1 [xx Feb]</td>
</tr>
<tr>
<td>15%</td>
<td>Exam #2 [xx Mar]</td>
</tr>
<tr>
<td>15%</td>
<td>Exam #3 [xx Apr]</td>
</tr>
<tr>
<td>20%</td>
<td>Final project write-up [xx May, by electronic turn-in via Blackboard]</td>
</tr>
</tbody>
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**Attendance/Absence and Tardiness:** Lecture and lab attendance is mandatory. I will generally take attendance towards the beginning of a lecture or lab session, but it may also happen at other times during a session depending on our tasks at hand. **If you are not present when attendance is taken, you will be recorded as being absent. For example, if you arrive to class late after attendance has been taken, you will be recorded as absent.** Four (4) recorded absences with any combination of lecture, lab, or field trip sessions will cause your final, overall class grade to be dropped by 10% (i.e. a full letter grade). For eight (8) recorded absences, it will be dropped 20%, and so on, and so forth. I understand that we all have emergencies and unexpected situations once in a while—hey, that is life, and there’s no avoiding it! But if you experience a situation like this, please make me aware of it as soon as possible else you may quickly run afoul of the above policy, and your overall class grade will suffer.

**Participation Grade:** Your participation in this class is of great importance, and will provide a valuable contribution to the class, really! How valuable is it? Well, valuable enough to provide 5% of your overall class grade (so it can easily push your grade up or down into a whole different letter category). I will assign participation scores throughout the semester based on a simple three category scheme outlined below, and then at the end of the semester I’ll normalize the results into a 5% overall grade contribution.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>great participation, but also thoughtfully allows others to participate</td>
</tr>
<tr>
<td>1</td>
<td>normal, average participation</td>
</tr>
<tr>
<td>0</td>
<td>student absent, or inadequate participation, or actions exclude, discourage, or disrupt participation by others, or student using cell phone or other device</td>
</tr>
</tbody>
</table>
**Grading Criteria (i.e. How Assignments are Evaluated):** All assignments will be evaluated and assigned grades using criteria specified in the table below.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>superior explanation and supporting materials (samples, examples, data, figures, etc.); unusual and original insight and analysis; goes well beyond minimum required for assignment</td>
</tr>
<tr>
<td>90%</td>
<td>good solid job on explanation with very good to excellent supporting materials; excellent reasoning or analysis; goes beyond the minimum required for the assignment</td>
</tr>
<tr>
<td>80%</td>
<td>good solid job with decent supporting materials; does what the assignment asks; decent reasoning or explanations</td>
</tr>
<tr>
<td>70%</td>
<td>decent explanation, but too general, and/or incomplete supporting materials, and/or some inaccuracies or flaws in reasoning, and/or coverage is accurate but cursory, and does not meet the minimum required for a complete answer</td>
</tr>
<tr>
<td>0-60%</td>
<td>answer missing, and/or does not effectively address assignment or answer question, and/or fails to support explanations/analyses with data or examples, and/or unclear explanations, and/or inadequate understanding, and/or major flaws in reasoning or explanations</td>
</tr>
</tbody>
</table>

The prevent the loss of portions of multipart assignments, complete assignments must be turned in neatly bound by a staple or paper clip. **Multipart assignments that do not meet this criteria will not be accepted.** Do this ahead of time so you do not miss the short window of opportunity for assignment turn-in (see “Assignment Turn-in and Late Assignments” section below).

**Assignment Turn-in and Late Assignments:** When an assignment due date/time arrives, assignments will *only* be accepted during the short window of time (~2-3 minutes) that is needed for the actual collection process. Given that assignments are often collected at the beginning of lecture/lab sessions, if you arrive late, you will probably miss the short window of opportunity for assignment turn-in. Late assignments will not be accepted.

**Exams:** Three exams will be given for the class during the semester, the first on xx Feb, the second on xx Mar, and the third on xx Apr. The exams will be cumulative, but overwhelmingly focused on the material since the previous exam. Each of the exams composes 15% of your overall class grade. More details about the exam format will be given beforehand, but in general, you can expect short answer style questions in which you may be asked to provide diagrams. Review sessions (specifically, questions/answers you have about material) will be held in the final half hour of the lecture preceding an exam day provided that 2/3 of the class requests it (done by vote).

**Cell Phones and Other Electronic Device Usage:** Cell phones and other electronic devices should be turned off during lecture, lab, and field trips. This extends to laptop computers if you are not using the computer specifically for class work (e.g. to take notes). The only exception to this policy is when we are traveling on the vans to/from our field trip locations. Please see the “0” (zero) category grade description in the “Participation Grade” section above for further info.
**Labs, Field Trips, and Safety:** Lab protocol and safety best practices as specified in the mandatory, online course SMTE 0091 Laboratory Safety Seminar will be followed during lab sessions. This means that appropriate attire, including closed toe footgear, must be worn for lab. Additionally, no food/drink (even simply bottles of water) may be taken into lab facilities.

Though many of our lab sessions will take place indoors, we will also take several local field trips by combining our back-to-back Monday lab and lecture sessions into a single time block. We will also take a single, day-long field trip to the Austin area on Saturday, xx April to study a sedimentary rock sequence live in the field.

Regarding field trips, when we go to the field appropriate footgear is critical. It should be comfortable, but secure footgear like boots or tennis shoes (not flip-flops, sandals, etc.). You should also dress appropriately for protection from the sun, insects, and vegetation (long sleeves, pants, hat, sunglasses, sunscreen, etc.).

Whether we stay in the lab or go to the field, your safety during these events is of the utmost importance—even beyond the sedimentology and stratigraphy! While I don’t expect any unsafe or dangerous situations, use common sense if something unexpected develops, and let me know about it immediately.

**Academic Honesty and Working Together:** Much of the time you’ll be working together in small groups or teams to observe, brainstorm, analyze, interpret, report, etc. And in many cases, we’ll be sharing the exact same data sets, photos, samples, and other resources. So undoubtedly results will be similar in many cases. However, for any assignment that you are supposed to turn in (for example, lab write-ups, figures and diagrams, larger reports and papers, other misc. assignments), it should be produced by you *independently*. If there is ever a question about whether you can work together or not, ask me for clarification, or simply assume that you should work independently.

**Plagiarism:** We have a zero tolerance for plagiarism, and the University explicitly provides us a tool to uncover it (see [http://academicaffairs.tamucc.edu/turnitin.php](http://academicaffairs.tamucc.edu/turnitin.php)). I am obligated to report plagiarism if I encounter it, and I will do so. Explanatory resources about what constitutes plagiarism can be found at the [http://www.plagiarism.org/](http://www.plagiarism.org/) website. If you have any questions about this, please ask.

**E-mail Communication:** I will routinely communicate information to the class via e-mail. TAMUCC ITS can only guarantee e-mail delivery as far as its own e-mail systems (i.e. your islander.tamucc.edu e-mail account). Thus, if you choose to use a different e-mail provider (for example, by forwarding your mail elsewhere like Hotmail.com or Yahoo.com), there is a strong possibility that e-mail to you may be delayed by many hours, or even completely rejected. While a few hours delay may not matter for most communications, if it happens for something time sensitive, or an e-mail is completely rejected, this is problematic. These situations are beyond my control, and generally beyond the control of TAMUCC ITS. Therefore, if you choose to use an e-mail provider besides TAMUCC ITS, you also accept the responsibility that you may receive e-mail communications late, or not receive them at all.
**Course and Reading Schedule:** Our tentative schedule for the semester is provided below. Included are the appropriate readings in Prothero and Schwab (2003). Undoubtedly, the schedule will change according to our tempo—we may have to shift things backwards or forwards, or perhaps eliminate some of the listed material. I will keep you informed if this happens. Nonetheless, the shifting backwards or forwards of lecture or lab material will NOT affect a few certain events that are fixed-in-time in our schedule. These fixed-in-time events include the exams, the day-long field trip, and the final project write-up. These items are indicated with note about this in the schedule below.

**Week 1:**
xx Jan (Wed)—class introduction; weathering and origin of sediments (Chaps. 1-2)

**Week 2:**
xx Jan (Mon)—NO LAB/LECTURE—TAMUCC Holiday, Martin Luther King Jr. Day
xx Jan (Wed)—flow regimes and particle E+T+D (Chaps. 3-4)

**Week 3:**
xx Jan (Mon)—Lab #1—Blind Oso wind tidal flats exploration
xx Jan (Mon)—bedforms, bedding, sedimentary structures (Chaps. 3-4)
xx Jan (Wed)—siliciclastic sedimentary rocks (Chaps. 5-6)

**Week 4:**
xx Jan (Mon)—Lab #2—Stoke's Law and virtual pipette grain size analysis
xx Jan (Mon)—sedimentary texture and grain size (p. 81-91)
xx Feb (Wed)—lithification and diagenesis (Chap. 7)

**Week 5:**
xx Feb (Mon)—Lab #3—Siliciclastic sedimentary rocks week I
xx Feb (Mon)—facies concept intro; alluvial fan and playa systems (p. 127-134)
xx Feb (Wed)—Exam #1 [FIXED-IN-TIME EVENT]

**Week 6:**
xx Feb (Mon)—Lab #4—Siliciclastic sedimentary rocks week II
xx Feb (Mon)—braided fluvial systems (p. 134-139)
xx Feb (Wed)—meandering fluvial systems (p. 139-144)

**Week 7:**
xx Feb (Mon)—Lab #5—Paleoflow analysis
xx Feb (Mon)—lacustrine systems (p. 144-149)
xx Feb (Wed)—eolian and glacial systems (p. 149-158)

**Week 8:**
xx Feb (Mon)—Lab #6—University Beach grain size analysis part I
xx Feb (Mon)—delta systems (p. 159-168)
xx Mar (Wed)—barrier island and coastal systems (p. 171-182; Ackerman 1997 [NATGEO])
**Week 9:**  
xx Mar (Mon)—Lab #7—University Beach grain size analysis part II  
xx Mar (Mon)—carbonate sedimentary rocks (Chap. 11)  
xx Mar (Wed)—Exam #2 [**FIXED-IN-TIME EVENT**]

**SPRING BREAK Week:**  
xx Mar (Mon)—NO LAB/LECTURE (TAMUCC Spring Break Holiday)  
xx Mar (Wed)—NO LECTURE (TAMUCC Spring Break Holiday)

*******Week 10:**  
xx Mar (Mon)—Lab #8—TBA  
xx Mar (Mon)—carbonate sedimentary environments (Chap. 12)  
xx Mar (Wed)—other biogenic and chemical sedimentary rocks (Chaps. 13-14)

**Week 11:**  
xx Mar (Mon)—Lab #9—Carbonate and other sedimentary rocks week I  
xx Mar (Mon)—lithostratigraphy concepts, transgression/regression (p. 302-310)  
xx Mar (Wed)—unconformities and completeness of the geologic record (p. 311-317)

**Week 12:**  
xx Apr (Mon)—Lab #10—Carbonate and other sedimentary rocks week II  
xx Apr (Mon)—correlation; Sloss sequences; Phanerozoic sea level variation (p. 317-328)  
xx Apr (Wed)—bio-, magneto-, and chemostratigraphy (Chap. 16 and p. 377-384)  
xx Apr (Sat)—Day-long field trip to the Austin area [**FIXED-IN-TIME EVENT**]

**Week 13:**  
xx Apr (Mon)—Lab #11 (combined with lecture block)—Field trip to PINS for sediment core retrieval  
xx Apr (Wed)—Exam #3 [**FIXED-IN-TIME EVENT**]

**Week 14:**  
xx Apr (Mon)—Lab #12 (combined with lecture block)—Split and log PINS sediment cores  
xx Apr (Wed)—geochronology and chronostratigraphy (Chap. 18)

**Week 15:**  
xx Apr (Mon)—Lab #13—Fence diagrams and stratigraphic correlation  
xx Apr (Mon)—sequence stratigraphy basics  
xx Apr (Wed)—tectonics and sedimentation (p. 423-454)

**Week 16:**  
xx May (Mon)—Lab TBA  
xx May (Mon)—TBA  
xx May (Mon)—final project write-up electronic turn-in [**FIXED-IN-TIME EVENT**]
**How to Drop This or Any Class:** I hope that you never find it necessary to drop this or any other class here at Texas A&M University—Corpus Christi. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. 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. Friday, xx April 2012, is the last day to drop a class with an automatic grade of “W” this term.

**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.

**Disabilities Accommodations:** 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 at (361) 825-5816 in Driftwood 101. 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.

**Academic Advising:** The College of Science and Technology 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. The College's Academic Advising Center is located in Faculty Center 178, and can be reached at 825-6094.

**Grade Appeals:** As stated in University Rule 13.02.99.C2, Student 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 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 Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamu.cc/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.