

Earth Surface Processes Syllabus (GEOL212)

Spring 2014

<i>Instructor:</i>	Amanda Schmidt
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<i>Email address:</i>	
<i>Office hours:</i>	Mon 1:30-3:00 pm Thur 2:00-3:30 pm
<i>CLEAR center tutor:</i>	
<i>CLEAR center hours:</i>	Sun 2-4 pm, 7-11 pm; Mon-Wed 7-11 pm, Science Library
<i>Class meeting times:</i> Lecture:	Tues, Thur 9:30-10:50 am, CARN 212
Lab:	Fri 1:30-4:30 pm, CARN 212

If you need to come see me but cannot come during regular office hours, you may make an appointment for another time. If you do not understand some of the course material, please ask questions before it is too late! To encourage you to come see me, there is 1 extra credit point available if you come to see me during office hours (or a different time that you arrange) during the first two weeks of the semester.

Why Earth Surface Processes?

Landscapes surround us all and often seem to be static, unchanging backdrops for our day-to-day activities. Yet, if we begin to look closely, landscapes are anything but static features; they are continually evolving at a variety of temporal and spatial scales. Earth Surface Processes, or geomorphology, is the study of landscapes, their forms, and the history and processes of their development. Properly done, the study of earth surface processes must consider any number of processes and Earth characteristics: structure, lithology, tectonics, weathering, hydrology, and in most of the world today, humans.

My overarching goal for you, as students, was best expressed by one of my colleagues, “After this class you’ll never look at a landscape the same way again. You’ll always stop and wonder how and why the land looks the way it does...” This spring, Earth Surface Processes at Oberlin will focus primarily on rivers and hillslopes, the elements that make up just about every sub-aerial landscape in the world.

My teaching philosophy

GEOL212 is designed to be a partnership between me, the professor, and you, the students. My aim for the class is to minimize the time I stand in front of you and lecture and, instead, to maximize the time that you are applying earth surface processes topics to activities. This way you learn the material more deeply as you are not only practicing the intellectual knowledge, but you are able to apply it to a variety of situations. I will give you a chance for a mid-term evaluation of my teaching, but if you have suggestions prior to or after that, please let me know.

How to succeed in Earth Surface Processes

All class meetings require active involvement. To participate, you must prepare before each class.

Before each scheduled class, read the appropriate parts of the text book or other readings and take notes on it. I commit to not giving you more than 30 pages of reading for a single class (in final textbook format), but in return I expect that you spend the time to do the reading. Each class day for which textbook reading is due will start with a short (~3 question) quiz drawn from the knowledge assessment

questions at the end of the chapter. I include quizzes in the class because they are pedagogically useful – numerous studies suggest that students retain knowledge better and for longer if tested on it. Quizzes will be part of your participation grade.

Email me before 7:00 am on the day of class if you have questions or topics you want me to clarify that day, and I will respond at the beginning of class before the quiz. Class time is for in-class and laboratory exercises that assume prior knowledge from reading assignments. If I receive no questions or requests, I will assume everyone in the class understands the reading and that we can proceed with applying it. That being said, I recognize your desire for some lecture-type structure to the class, so we will have some content-related lecture every week following the quiz. However, even lectures will require you to be an active participant in the class.

During the last two minutes of each class meeting, you will describe in writing the Murkiest Point – something from that class you still do not fully understand. If you understand everything, instead describe the Most Interesting Point. You will sign this paper and hand it in as you leave. To be marked as attending the class, you must write something related to the day's class on your paper. I will begin the next class with an explanation of “murkies” that are common to many people; otherwise I will email you personally with an explanation; this is an important opportunity for additional clarification.

Learning goals

By the end of the semester, in addition to learning material related to specific topics we cover in the class, you will be able to:

- a. Collect and analyze survey data
- b. Use Excel to run simple numerical models, analyze data, and create figures displaying the data
- c. Conduct geomorphic investigations by:
 1. Asking questions
 2. Formulating hypotheses relevant to the questions
 3. Determining how to test the hypothesis
 4. Collecting data necessary to test the hypothesis
 5. Analyzing the data collected
 6. Communicating results of the analysis in a formal lab report
- d. Read and summarize academic papers
- e. Assess landscapes and identify processes that shape Earth's surface
- f. Identify the setting and temporal period of different geomorphic processes

Academic honesty

This semester there will be two comprehensive concept sketches – one in lieu of a midterm, one in lieu of a final. While you may consult with classmates, me, your notes, the textbook, and online materials, the final concept sketch you turn in must represent your own work. I expect you to write out and sign the Honor Pledge on each sketch to attest to your adherence to the Honor Code. I will not record your grade for an exam until the pledge is signed. You will also complete 8 lab exercises in teams of four. Each person will write two of the lab reports. Although these are expected to be group efforts (and you will have a teammate peer review your report), the written reports you turn in must represent your work and your understanding of the material.

Attendance

Attendance at all scheduled class meetings is very important. Each class includes activities that you complete alone or in teams. You are responsible for all material covered during class, whether you were present or not. If you are absent, look at what you missed on the topic schedule and discuss what we did with a classmate or me. If you are an athlete, you should give me the letter from your coach outlining what days you will need to leave early or miss class due to games as soon as you receive it. If you are sick, please let me know as soon as possible that you cannot attend class. A record of the Murkiest Point papers will assess your attendance.

Computers and phones in class

Unless I state otherwise, computers, phones, and other digital devices are not to be used during class time. If you wish to use a computer to take notes, I expect that you will be taking notes and not goofing off on the web. I commit to not using my phone during your class and I need your commitment that you won't use your phone during my class.

Laboratory and Field Trip Fee

Due to field trip costs and lab expendables, there is a **laboratory fee of \$10** that will be collected from each of you. The fee helps to offset the cost of renting vans and purchasing maps, etc. This will normally be applied to your first semester bill after ADD/DROP. If you wish to pay this and not have it applied to your bill, please see Pat Sturges in Carnegie 403 before the Friday after ADD/DROP is completed.

Resources

Textbooks and other class materials

We will be using a brand new textbook, *Key Concepts in Geomorphology* (Bierman and Montgomery), for the class. It is available online or at the bookstore. A copy is also on reserve in the library. All readings, assignments, and field trip information will be posted on Blackboard. If you will need them, bring reading assignments and notes on them to class.

You should also have and bring with you to class and lab each day:

- A C-Thru W-8 plastic ruler/protractor or equivalent (metric and tenths of inches)
- Sharp or mechanical 2H pencils
- Colored pencils
- Calculator
- A binder for the handouts I give you in class
- Loose leaf graph or notebook paper in the binder

Blackboard

Blackboard is an online course-management system we will use that is accessible with your ObieID. Through Blackboard, you will receive important announcements from me, communicate with classmates, and access course materials. You can login at <http://blackboard.oberlin.edu>.

Tutoring and other assistance

If you are in any way concerned about your ability to succeed in this course, you should get help immediately. Yue Qiu, a tutor in the CLEAR center, has taken this class and is serving as a special tutor for our course. In addition, other CLEAR center tutors can help with data reduction and analysis. Student Academic Services is the best resource for you to determine how to get that help, whether it is tutoring, seeing me for extra help, or help with organizing yourself to keep up with the class. They are located in Room 118, Peters Hall. More information is online at <http://new.oberlin.edu/arts-and-sciences/academic-resources-and-support/student-academic-services.dot>.

If you require special accommodations, the Office of Disability Services will provide those for you. Remember you must provide all relevant documentation to the Office of Disability Services. They will supply you with a letter to share with me so that I know what accommodations you need and can arrange to meet those accommodations. It is most helpful if we work the details out well before your need for accommodation arises. The Office of Disability Services is located in Peters G-27/G-28.

Assignments

All assignments, except for concept sketches, should be turned in digitally on Blackboard.

First week assignments

- Read chapter 1 of the Bierman and Montgomery text by Thursday.
- Read this syllabus carefully! Note especially your responsibilities in the course.
- I will communicate via Blackboard using your @oberlin.edu account. If you check a different e-mail account more frequently, go to CIT's website (<http://new.oberlin.edu/office/cit/index.dot>) or your Oberlin email (<http://ocmail.oberlin.edu>) to set up email forwarding.

Readings

Readings for the class will come primarily from the Bierman and Montgomery text book. We will also read some academic papers when they are relevant to topics we are discussing in class. BEFORE each Tuesday, read appropriate parts of the chapters identified on Blackboard. You are expected to be familiar with reading material before class unless you let me know what you are confused about. There will be quizzes at the start of class because this will help you to retain the material you read.

Labs

Labs will be done in permanent teams of four that you choose after add-drop ends. There are 8 labs in the semester that require formal lab write ups – for each lab one person in the group will be the writer, one person the peer reviewer, and two people will make concept sketches summarizing the lab. You will rotate jobs so that everyone writes and edits two labs and makes concept sketches for four. You are responsible for the content of each lab, even during weeks when you are not the writer. Lab reports are due at midnight the Thursday following the week in which the lab was completed (dates are noted on your topic schedule); concept sketches are due in lab the next day.

Regardless of what role you take in a given week, you will work with your team to collect and analyze the data. The writer then has to write the first draft of the lab report and give it to the peer reviewer for edits. The peer reviewer will read the lab report, make comments on it, and write a short summary of what the

lab report says and what major issues need to be corrected before turning it in. The writer then makes appropriate changes and writes a cover letter that briefly summarizes the lab and what changes have been made in response to the peer reviewer's comments. The writer turns in to me his/her cover letter, the final draft of the lab, the report from the peer reviewer, and the marked up first draft of the report. The concept sketch makers summarize the lab in a concept sketch.

Lab points will be assigned as follows:

- Writer: 25 points
- Peer reviewer: 5 points
- Concept sketch maker: 10 points

On the 2nd Thursday of class you will form teams and fill in a form telling me who is responsible for what task for each lab.

Lab reports should be typed, double-spaced, in 12 pt font with standard 1 or 1.25" margins, and no more than 8 pages long (not counting figures or tables). The purpose of the assignments is not only to enhance your understanding of the lab exercise, but also to work on your writing skills. The honor code must be written and signed on all lab reports. I recommend using the writing center (<http://new.oberlin.edu/arts-and-sciences/departments/rhetoric/writing-associates-program/writing-center.dot>) for assistance with your lab reports. The CLEAR center (<http://new.oberlin.edu/office/clear/student-resources/drop-in-tutoring/index.dot>) can help with data reduction and analysis.

If they are later than midnight on the day they are due, they are late. **10% of the grade for an assignment is deducted for each day that any part of the assignment is late.** This is for two reasons: 1) I make an effort to grade and return work within a few days so that your work can improve based on my comments on previous work. If work is not turned in on time, then I cannot return it to you before your next assignment is due; 2) a strict deadline for assignments maintains equity among the class by ensuring that everyone has the same amount of time to complete assignments.

Field trips

Because none of us wants to be inside on Friday afternoons, many of our labs will be field trips; please arrive to lab promptly on field trip days or we will leave without you. As you may have heard, I am cursed with bad field trip weather. Field trips will not be canceled due to weather unless it is dangerous. One (18-19 April) is an overnight field trip starting during lab Friday; one student from each lab team (the writer) must be there. We will return by 8 pm Saturday.

You should bring appropriate footwear (closed toed shoes which can get wet; if you don't have some, I recommend going to the free store and finding a pair; the department does not have enough waders to loan to everyone in the class), a notebook, pencil, field trip hand out, appropriate clothing (including layers or rain gear, as necessary) and perhaps a towel for the river labs. You may want to bring a snack.

Midterm Concept Sketch

You will complete concept sketches in lieu of a midterm exam. I will give you more information on this when the date is closer. You will complete small concept sketches in class and as part of lab assignments, so you will be familiar with the type of assignment before the midterm.

Final Project

The end of the semester will be spent working on research projects completed in pairs. You will write a short proposal for the project in the beginning of the second half of the semester, propose your methods two weeks later, and then use two weeks of lab time collecting data. Your projects will be presented to the class during a poster session during the final lab period. You must be present at the poster session in order to pass the class. You will also write a final paper on your project, which is due at the time of the final exam (4 pm on 15 May).

Participation

Participation is worth 15 points (of 300) towards your final grade this semester. Class attendance, quizzes, and attitude in class will all be factored into your participation grade.

Grading procedures

The class is graded out of 300 points (excluding extra credit) distributed in the following way:

1 Midterm concept sketch	= 50
Final Project	
Proposal	= 10
Methods proposal	= 5
Poster	= 35
Paper	= 75
Labs	
2 as writer @ 25 each	= 50
2 as peer reviewer @ 5 each	= 10
5 as concept sketch maker @ 10 each	= 50
<u>Participation and quizzes</u>	<u>= 15</u>
Total	= 300

Note: In addition to a passing grade for the course, you are required to turn in your midterm concept sketch, your final project (including attending the poster session), and your part on all 9 labs (including the first one where everyone does a concept sketch) in order to pass the course.

Extra credit: I will occasionally give extra credit for work done beyond what is required for the class. You may earn up to 10 extra credit points towards your final grade.

To determine the letter grade for a test or exam or for the course:



1. Calculate your percentage based on the total possible points using this ratio: $\text{points obtained}/\text{total possible points} \times 100 = \%$
2. Covert the percentage to a letter grade using the scale below:

A = 93-100%	B- = 80-82.9%	D+ = 67-69.9%
A- = 90-92.9%	C+ = 77-79.9%	D = 63-66.9%
B+ = 87-89.9%	C = 73-76.9%	D- = 60-62.9%
B = 83-86.9%	C- = 70-72.9%	F = 00-59.9%

Topic Schedule

Topics to be covered are outlined below. *Assignments due each day (at the beginning of class) are in italics. Labs which are field trips are noted in bold.* Reading assignments will be posted on Blackboard at least one week prior to the date they are due. While the information in the table below is subject to change, dates that the midterm and final concept sketch are due will not change.

	Class (TTh 9:30-10:50)	Lab (F 1:30-4:20)
3-7 Feb.	<u>Introduction to Earth Surface Processes</u> <i>Read Chapter 1 and syllabus for Thursday (quiz)</i> Introduction to Earth Surface Processes Observation vs Interpretation What is a concept sketch?	Observations and Interpretations <i>Concept sketches due Friday 14 Feb at 1:30 pm</i>
10-14 Feb.	<u>Tools in geomorphology</u> <i>Chapter 2 due Tuesday (quiz)</i> What goes in a lab report? Relative and absolute dating Measuring rates of geomorphic processes Experiments in geomorphology	Threshold hillslopes <i>Lab write up and peer edits due Thursday 20 Feb at 11:59 pm;</i> <i>Concept sketches due Friday 21 Feb at 1:30 pm</i>
17-21 Feb.	<u>Weathering and Soils</u> <i>Chapter 3 due Tuesday (quiz)</i> Physical and chemical weathering Soil development Describing soils	Gravestone weathering <i>Lab write up and peer edits due Thursday 27 Feb at 11:59 pm;</i> <i>Concept sketches due Friday 28 Feb at 1:30 pm</i>
24-28 Feb.	<u>Geomorphic Hydrology</u> <i>Chapter 4 for Tuesday (quiz)</i> Precipitation Evapotranspiration Hydrology	Channel evolution <i>Lab write up and peer edits due Thursday 6 Mar at 11:59 pm;</i> <i>Concept sketches due Friday 7 Mar at 1:30 pm</i>
3-7 Mar.	<u>Hillslopes 1</u> <i>Chapter 5 for Tuesday (quiz)</i> Slope-forming materials Diffusion-like hillslope processes	Hillslope diffusion <i>Lab write up and peer edits due Thursday 13 Mar at 11:59 pm;</i> <i>Concept sketches due Friday 14 Mar at 1:30 pm</i>
10-14 Mar.	<u>Hillslopes 2</u> <i>Read paper for Tuesday</i> Advective hillslope processes Slope stability Slope morphology	Hillslope failure <i>Lab write up and peer edits due Thursday 20 Mar at 11:59 pm;</i> <i>Concept sketches due Friday 21 Mar at 1:30 pm to my box</i>
17-21 Mar.	<u>Glaciers</u> <i>Chapter 9 for Tuesday (quiz)</i> Alpine glaciers Ice sheets Modeling glacial erosion	No class Friday due to Baha'i Holy Day. Please work on your midterm concept sketch. <i>Midterm concept sketches due Thursday 4 Apr at 9:30 am</i>
24-28 Mar.	SPRING BREAK	

31 Mar. – 4 Apr.	<u>Channels 1</u> <i>Midterm concept sketch due Thursday at 9:30 am</i> <i>Chapter 6 for Tuesday (quiz)</i> External controls Fluvial processes Sediment transport	Sediment transport <i>Read Field Hydro Manual for lab</i> <i>Lab write up and peer edits due Thursday 10 Apr at 11:59 pm;</i> <i>Concept sketches due Friday 11 Apr at 1:30 pm</i>
7-11 Apr.	<u>Channels 2</u> <i>Read paper for class Tuesday</i> <i>Final project proposal due by 11:59 pm Tuesday</i> Channel patterns Channel-reach morphology Floodplains	Meander bends <i>Lab write up and peer edits due Thursday 17 Apr at 11:59 pm;</i> <i>Concept sketches due Friday 18 Apr at 1:30 pm</i>
14-18 Apr.	<u>Drainage basins</u> <i>Chapter 7 for Tuesday (quiz)</i> Basin-scale water and sediment budgets Channel networks and basin morphology Upland to lowland continuum	Upstream to downstream change Overnight field trip <i>Lab write up and peer edits due Thursday 24 Apr at 11:59 pm;</i> <i>Concept sketches due Friday 25 Apr at 1:30 pm</i>
21-25 Apr.	<u>Tectonic geomorphology</u> <i>No class Tuesday (Baha'i Holy Day)</i> <i>Chapter 12 for Thursday (quiz)</i>  <i>Project methods due by 11:59 pm Tuesday</i> Tectonic geomorphology Modeling landscapes	<i>No lab Friday (Keck symposium)</i> Work on your final projects
28 Apr.-2 May	<u>Landscape evolution</u> <i>Chapter 14 for Tuesday (quiz)</i> <i>Read paper for class Thursday</i>  Forming and evolving landscapes	<i>No lab Friday (Baha'i Holy Day)</i> Work on your final projects
5-9 May	Final project work time	Final class party and poster session
15 May	Your final paper on your project is due to Blackboard by 4 pm on 15 May. College policy requires that I do not accept late assignments.	