

GLY 367: Geomorphology (WI)

Fall 2008 3 credit hours

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http://web.cortland.edu/barclayd/geomorph/367_index.htm

Office hours: M, T, W, R 11:30 am - 12:30 pm; F 12:30 pm - 1:30 pm
or by appointment, or at any other time if I am available.

Lecture: 339 Bowers; M, W 10:20 - 11:10 am

Laboratory: 339 Bowers; Tu 1:15 - 4:05 pm

Textbooks: Ritter, D.F., Kochel, R.C. and Miller, J.R., 2002, Process
Geomorphology, 4th ed.: Boston, Waveland Press, Inc, 560 p.
Harrelson, C.C., Rawlins, C.L. and Potyondy, J.P., 1994, Stream
Channel Reference Sites: an illustrated guide to field technique:
General Technical Report RM-245, Fort Collins, CO, U.S.D.A.
Forest Service, 61 p. [pdf file at course website]

Catalog course description:

“Processes of glaciers, rivers, mass wasting, wind and weathering, and their resulting landforms. Methods of geomorphic analysis and the evolution of landscapes. Two lectures, one three-hour lab. field trips. Prereq: GLY 261. (3 cr. hr.)”

Course attendance policy:

I expect you to attend all lecture and lab sessions and fieldtrips. Please familiarize yourself with official college policy regarding attendance and absences (Section 410.12 of the College Handbook).

Be responsible for your own education. If you miss a class, get the notes from a colleague before the next class. If you miss an exam, you must contact me as soon as possible with a valid reason for your absence or you will receive a zero for that exam. Ask questions and get involved in class discussions: your participation and attitude will be used to aid final grade determinations for borderline situations.

Academic integrity:

I expect you to abide by the SUNY Cortland standards of academic integrity (Chapter 340 of the College Handbook). Stated simply, this means that you will not commit plagiarism, nor cheat on exams or assignments, nor help others plagiarize or cheat.

Academic accommodations:

If you are a student with a disability and wish to request accommodations, please contact the Office of Student Disability Services located in B-40 Van Hoesen Hall or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because many accommodations require early planning, requests should be made as early as possible.

Evaluation of student performance:

There will be three exams spaced equally through the semester (see course schedule). Questions on all exams will be drawn from material covered in lecture and lab since the previous exam. Exams will include slide identification, multiple choice, and short answer questions. The average of these exams will comprise 60% of your final grade. Three or four lab exercises will be completed for assessment and are due at the end of their respective lab sessions. There will also be two or three assessed homework exercises. The average of these lab and homework exercises will comprise 20% of your final grade.

Throughout this semester we will be studying the geomorphology of Hoxie Gorge in Cortland County, and this project will form the last 20% of your final grade. We will collect and analyze data during a number of labs, and you will interpret and present your results in three papers. The first two papers will be critiqued, graded and returned to you, and you will then revise and extend these to produce the final report. This project will provide you with both the experience of a field geomorphic investigation and also help you develop your technical writing skills.

A+ = 97-100	B+ = 87-89	C+ = 77-79	D+ = 67-69	E = 0-59
A = 93-96	B = 83-86	C = 73-76	D = 63-66	
A- = 90-92	B- = 80-82	C- = 70-72	D- = 60-62	

Reading assignments:

Recommended reading assignments for every class will be posted on the course website (web.cortland.edu/barclayd/geomorph/367_index.htm). This list will be updated regularly so keep checking back throughout the semester.

Laboratory equipment:

Please bring a scientific calculator, a 12" ruler, a sharp pencil, an eraser and your textbook to every lab.

Fieldwork equipment:

Please bring a raincoat, a warm sweater, boots, bug spray, a snack, a drink, a notebook and pencils/pens on every field trip. These are the minimum equipment for safe and comfortable work in the field.

Course overview:

Geomorphology is the study of landforms, landscapes and the processes that shape them. In this course we will take a process-oriented approach. By this I mean that we will seek to understand the mechanics and operation of a process before we consider how that process can produce specific landforms. Only when we see how processes create landforms can we begin to consider how landscapes develop. This process-oriented approach is particularly useful in environmental geology where geomorphic systems are managed and engineered for human benefit.

Specific course objectives and their links to NYSED standards are detailed on pages 4 and 5 of this syllabus (available online at course website).

Course schedule and activities: (tentative)

	<u>Lecture (10:20 - 11:10 am)</u>	<u>Laboratory (1:15 - 4:05 pm)</u>
01	Mon 25 Aug. Introduction; Energy & time	
02	Tue 26 Aug. -	L1. Topography and sediments (FIELD)
03	Wed 27 Aug. Glaciers & glaciology	
-	Mon 1 Sept. LABOR DAY	
04	Tue 2 Sept. -	L2. Sediments & landforms @ VHM (FIELD)
05	Wed 3 Sept. Glacier motion & erosion; Hw problem	
06	Mon 8 Sept. Landforms of glacial erosion	
07	Tue 9 Sept. Paper 1 assigned	L3. Hoxie Gorge sediments (FIELD)
08	Wed 10 Sept. Glacial sediments	
09	Mon 15 Sept. Glacial deposition	
10	Tue 16 Sept. Glacial landforms	L4. Glacial landforms (maps/images)
11	Wed 17 Sept. Effects of glaciation	
12	Mon 22 Sept. EXAM 1	
13	Tue 23 Sept. -	L5. Drainage basin analysis (maps/calcs)
14	Wed 24 Sept. Basins, hillslopes & channel initiation	
15	Mon 29 Sept. Hydrology basics	
16	Tue 30 Sept.* Paper 1 due; Rosgen classification	L6. Classifying channels (FIELD)
17	Wed 1 Oct.* Open channel flow	
-	Fri 3 Oct. [Instrument orientation]	
18	Sat 4 Oct. -	L7. Data collection @ Hoxie Gorge (FIELD)
19	Mon 6 Oct. Sediment transport	
20	Tue 7 Oct. -	L8. Present conditions of Hoxie Gorge (calcs)
21	Wed 8 Oct. Fluvial erosion	
22	Mon 13 Oct. Meandering channels	
23	Tue 14 Oct. -	L9. Sediment transport in Hoxie Gorge (calcs)
24	Wed 15 Oct. Braided & anastomosing channels	
25	Mon 20 Oct. Fluvial landscapes	
26	Tue 21 Oct. Paper 2 assigned	L10. TBA
27	Wed 22 Oct. Fluvial landscapes 2	
28	Mon 27 Oct. EXAM 2	
29	Tue 28 Oct. -	L11. Soils (FIELD)
30	Wed 29 Oct. Chemical weathering	
31	Mon 3 Nov. Physical weathering	
32	Tue 4 Nov. Paper 2 due	L12. Weathering & soils (samples/maps)
33	Wed 5 Nov. Weathering landforms	
34	Mon 10 Nov. Slope stability; Hw problem	
35	Tue 11 Nov. -	L13. Slope stability (COMPUTER)
36	Wed 12 Nov. Stability controls; Falls & slides	
37	Mon 17 Nov. Dry flows	
38	Tue 18 Nov. Wet flows; Final paper assigned	L14. Project wrap-up
-	Wed 19 Nov. Eolian processes & erosion	
39	Mon 24 Nov. Eolian deposits	
40	Tue 25 Nov. Arid environments	-
41	Wed 26 Nov. THANKSGIVING	
42	Mon 1 Dec. Landscape evolution	
43	Tue 2 Dec. CTEs	L15. Eolian envs & landforms (maps/images)
44	Wed 3 Dec. Landscape evolution; Final paper due	
45	Mon 8 Dec. EXAM 3 @ 1 pm	

* Rosh Hashanah

Course objectives:

By the end of this course I expect you to be able to do the following (the lectures and assignments that specifically address each objective are in italics; numbers following each course objective are NYSED Sub Area standards):

1. Explain how geomorphic processes (glaciers, rivers, weathering, mass wasting and wind) operate on Earth to create landforms and landscapes. [0021, 0023, 0024]
Taught and applied throughout course.
2. Relate the “delicate balance” of driving forces (climate) versus resisting framework (geology) to a range of landscapes and landforms. [0002, 0017, 0020, 0023]
Lecture in August and applied throughout course.
3. Relate geomorphic processes to the flow of energy from the Sun, gravity and Earth's internal heat. [0020, 0021, 0024]
Lecture in August and applied throughout course.
4. Identify linkages between different geomorphic processes and systems. [0021]
Applied throughout course.
5. Relate geomorphic processes to societal concerns. [0002, 0005]
Applied throughout course.
6. Read and obtain geomorphic data from topographic and thematic maps. [0006]
Labs 1, 3, 4, 5, 6, 8, 9, 12, 14, and 15.
7. Identify and interpret specific landforms and geomorphic features on aerial photos, radar images, topographic maps and from rock hand samples. [0006]
Labs 4, 12 and 15.
8. Identify landforms in the field and interpret their formative processes. [0021]
Fieldtrips throughout course.
9. Collect geomorphic data and observations in the field. [0003]
Fieldtrips throughout course.
10. Analyze data and model geomorphic processes using hand calculations, computers and physical models. [0001, 0003, 0004, 0006]
Labs 5, 8, 9, 12, 13 and 15, and homework exercises.
11. Synthesize and explain geomorphic data and analyses in written reports. [0003, 0004]
Writing assignments throughout course.

Assessment of course objectives:

	1	2	3	4	5	6	7	8	9	10	11
Exam 1	✓	✓	✓					✓			
Exam 2	✓	✓		✓	✓			✓		✓	
Exam 3	✓	✓	✓	✓	✓			✓		✓	
Lab. 5	✓	✓				✓	✓				
Lab. 12	✓	✓		✓		✓	✓				
Lab. 13	✓	✓	✓	✓	✓					✓	
Lab. 15	✓	✓		✓		✓	✓				
Project	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

SUNY Cortland Conceptual Framework:

This course addresses Learning Outcomes 2 and 11 of the SUNY Cortland Conceptual Framework. Specifically, students will develop in-depth knowledge of the science of Geomorphology, and will learn how to use computers to analyze and model geomorphic processes.