

Geomorphology Spring 2024 Syllabus

Scripps Institution of Oceanography/ University of California, San Diego

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SIO 153 – Geomorphology

Lectures: Tu-Th 9:00-9:50 am (Eckhart 127)

Laboratories: Tu-Th 10:00-10:50 am (Eckhart 127)

This course is designed for undergraduate students majoring in Geosciences, Environmental Systems, and physical science-related disciplines and will integrate materials that students have learned from previous classes. It will provide students with (1) basic knowledge and tools to understand the processes that shape landscapes, (2) concepts on the growth of mountain ranges and fault zones, (3) generation and removal of regolith on hillslopes, (4) sediment transport in erosional bedrock channels and depositional river systems, (5) coastal evolution in response to terrestrial and marine processes, and (6) Earth-surface and climate interactions from the atmospheric scale to the grain scale. At the end of the class students are required to acquire the requisite skills related to geomorphology and appropriate writing and quantitative skills by completing class assignments, field-based observations, and exams. Concurrent enrollment in the lab section is required.

Course Materials and Requirements

Computer: internet access, mouse or track pad, Google Earth Pro on desktop (free download)

Field Gear: field book, hand lens, camera phone, pencils, coloring pencils

Required Text: Anderson and Anderson, *Geomorphology: The Mechanics and Chemistry of Landscapes*. First edition, 2010. ISBN: 978-0-521-51978-6.

The class will use this book, including for some homework questions.

Course Structure

This course will be delivered in person and organized through the course management system on WebCampus. In WebCampus, you will access online lessons, course materials, and resources. At designated times throughout the semester, we will participate in a blend of self-paced and group-paced activities. In person instruction will take place outdoors on the Scripps Institution of Oceanography campus.

Grading Policy

Description	%
Exam 1	15
Exam 2	15
Homework	50
Lab Book	10
Presentation	10
total	100 %

Grade	Quarter Average	Grade	Quarter Average
A+	over 97	C+	77 to 80
A	93 to 97	C	73 to 77
A-	90 to 93	C-	70 to 73
B+	87 to 90	D	60 to 69
B	83 to 87	F	below 60
B-	80 to 83		

Paper Presentations (10%): Each student is required to give a 10-minute presentation on a research article published in the past two years on subjects related to the class. There will be a lecture further discussing how to find and present on such journal articles. Instructor approval is required. The best sources of papers are (1) Geomorphology; (2) Journal of Geophysical Research Earth Surface; (3) Environmental & Engineering Geoscience; (4) Earth Surface Processes and Landforms.

Homework Assignments (50%): There will be six homework assignments introduced in lab section focused on key concepts in lecture. The lowest homework grade will be dropped resulting in the highest five homework assignments counting towards the grade.

Lab Assignments (10%): Throughout the quarter lecture concepts will be supplemented with exercises that will be done in a group setting together in laboratory and in the field. I recommend you use a field/lab book to turn in each lab assignment to make grading and redistribution easier. These assignments will be due at the end of lab period. No late work allowed.

Late Assignment Policy: Homework assignments will be due at the start of class, and will be considered late once the lecture begins on that day. Each day (24-hour period from class time) that an assignment is late will reduce the maximum attainable grade by 1/2 letter. i.e., a perfect assignment 1 day late would be worth 95%, 6 days late 70%, etc. The maximum attainable grade will stop decreasing at 60%, which means it will always be worthwhile to turn in late assignments, accepted until Tuesday June 4.

Working Together Policy: I encourage you to learn from each other by working together on many aspects of these assignments, including discussing ideas and data analysis. However, I expect everyone to make their own plots and figures, and the wording of answers to specific questions must be completed on your own, and therefore should not be similar in wording to other people's work. Everyone must turn in their own separate assignments.

Lecture and Lab Schedule

Date	Lecture Topic	Lab Topic	Reading Assignment (A ²)
(T) April 2	1: Introduction to Geomorphology		Ch 1: 3-13
	<i>Lab 1</i>	<i>Beach Walk: Geomorphology of La Jolla</i>	
(Th) April 4	2: Generating Topography		Ch 2: 21-23; Ch 3: 38-43
	<i>Lab 2</i>	<i>Introduction to Homework 1 Isostasy- DUE April 11</i>	
(T) April 9	3: Tectonic Geomorphology 1		Ch 4: 69-83
	<i>Lab 3</i>	<i>Geologic Map of San Diego</i>	
(Th) April 11	4: Tectonic Geomorphology 2		Ch 6: 121-124; 128-131
	<i>Lab 4</i>	<i>Introduction to Homework 2 Paleoseismology- DUE April 18</i>	
(T) April 16	5: Atmosphere-Earth Surface Interactions		Ch 5: 107-117
	<i>Lab 5</i>	<i>Geologic Maps of Rain Shadows</i>	
(Th) April 18	6: Weathering		Ch 7: 160-210
	<i>Lab 6</i>	<i>Beach Walk: Soils and Weathering</i>	
(T) April 23	7: Hillslope Processes		Ch 10: 305-330
	<i>Lab 7</i>	<i>Introduction to Homework 3 Hillslopes- DUE April 30</i>	
(Th) April 25	8: Geomorphology of the Mojave Desert		
	<i>Lab 8</i>	<i>Geologic Map of the Mojave</i>	
(F-Su) April 26-28	Weekend Field Trip Mojave Desert (optional)		
(T) April 30	9: Landslides		Ch 10: 331-343
	<i>Lab 9</i>	<i>Beach Walk: Landslides of La Jolla</i>	
(Th) May 2	10: Bedrock Channels		Ch 13: 428-445
	<i>Lab 10</i>	<i>Exam 1 Review Lectures 1-8</i>	
(T) May 7	Exam 1		
	No lab		
(Th) May 9	How to Present a Geomorphology Journal Article		
	<i>Lab</i>	<i>Introduction to Homework 4 Landslides- DUE May 16</i>	
(T) May 14	11: River Systems 1		Ch 12: 382-394
	<i>Lab 11</i>	<i>Geologic Map of River Systems</i>	
(Th) May 16	12: River Systems 2		Ch 12: 396-414
	<i>Lab 12</i>	<i>Introduction to Homework 5 Rivers- DUE May 23</i>	
(T) May 21	13: Sediment Transport by Water		Ch 14: 453-464
	<i>Lab 13</i>	<i>Beach Walk: Sediment Transport</i>	
(Th) May 23	14: Sediment Transport by Wind		Ch 15: 477-489
	<i>Lab 14</i>	<i>Introduction to Homework 6 Sediment Transport- DUE May 30</i>	
(T) May 28	15: Coastal Geomorphology 1		Ch 16: 504-512
	<i>Lab 15</i>	<i>Beach Walk: Coastal Geomorphology of La Jolla</i>	
(Th) May 30	16: Coastal Geomorphology 2		Ch 16: 513-524
	<i>Lab 16</i>	<i>Review Exam 2 Lectures 9-16</i>	
(T) June 4	Student Presentations		
	<i>Lab</i>	<i>Student Presentations</i>	
(Th) June 6	Student Presentations		
	<i>Lab</i>	<i>Student Presentations</i>	
(M) June 10	Exam 2		8:00 am -10:59 am

Field Trip: Geomorphology of the Mojave River April 26-28th (Friday to Sunday)

This will be an optional trip with more details to be discussed further in lecture.

Campsite details:

Friday Night- Mojave River Forks Regional Park. 17891 CA 173, Hesperia, CA 92345

Saturday Night- Calico Ghost Town Regional Park. 36600 Ghost Town Road, Yermo, CA 92398

Trip is organized through Outback Adventures at UCSD. All food and transportation are provided.

However, you must provide your own camp gear (tent, sleeping bag, sleeping pad etc.)

Professionalism and Field Conduct

For your safety and the safety of others, and for maintaining the high-quality standard of UCSD field experiences, you must understand that your participation in a field experience requires following the rules below in regard to conduct while on the trip. Failure to abide by these rules will result in deduction of your professionalism grade.

- Following the instructions of trip leaders at all times and never leaving the group or the camp unless you have the permission of trip leaders.
- Respecting the properties, structures, areas and vehicles at and on which activities occur, and observing all rules and regulations of the properties, structures, areas and vehicles.
- No Geo-Vandalizing of outcrops especially in protected lands. Leave no trace rule is in full effect.
- Showing respect to others, including non-participants and the general public, at all times. Having appropriate behavior at all times, including in the evening hours.

I have zero tolerance policy when it comes to safety and misconduct. Failure to abide by these rules will result in removal from the course, a failing grade, and legal reporting to university administration or law enforcement.

- Never initiating or being involved in any activity that is dangerous to yourself or others, which includes; Not possessing or using any illegal drugs while on the trip, and not possessing weapons, including firearms.
- No discrimination or disrespectful behavior based on race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity.
- Not participating in sexual misconduct of any form. Sexual harassment is a form of discrimination and is unlawful. If sexual harassment is occurring to you, or if you witness sexual harassment occurring to others on the trip, you should report this behavior to the trip leader, a UCSD representative, and/or to law enforcement.
- Students are not allowed to bring guests, including children and pets on course activities.