University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

Sediment Dynamics in Coastal and Estuarine Environments

3 credits

MEES 7xx
Spring 2019

Course Objectives / Overview

This course focuses on sediment dynamics along the land-sea continuum, from intertidal to nearshore regions. The first part of the course develops relevant sediment-transport theories and equations used in the second part to examine coastal landscapes and features, including sediment/vegetation interactions. Integration of field observations and modeling approaches will be emphasized throughout the course, as will human impacts and responses to climate change.

Expected Learning Outcomes

Students will be able to:

1) Understand fundamental concepts of sediment dynamics in coastal and estuarine systems
2) Apply quantitative approaches to sediment transport and landscape formation
3) Review and summarize topical research papers
4) Connect course concepts to their own research topics
5) Communicate effectively in oral presentations and group discussions

Course Assessment / Grading

Homework	40%
Paper discussions	15%
Student presentations	15%
Final	30%

Homework: Homework will be assigned approximately every two weeks and will be administered through the course website.

Paper discussions: Most Wednesdays, we will read and discuss relevant papers from the primary literature. Each student will be the primary reader for several class meetings during the semester and will be expected to lead our discussion. Papers for discussion will be posted on Moodle, and the primary reader may designate additional papers. *Additional papers must be posted on Moodle 1 week in advance of the class meeting.* The primary reader will prepare a "summary outline" that will include 3-5 questions to guide discussion during the class meeting. This outline *must be made available to all students via email at least 1 hour before the start of class.* All students are considered secondary readers for each class meeting and are expected to actively participate in the discussion.

INSTRUCTOR DETAILS:
Cindy Palinkas
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CLASS MEETING DETAILS:
Dates: TBD
Times: TBD
Originating Site: HPL
IVN bridge number: TBD

CURRICULUM FULLFILMENT:
Elective

Prerequisites
MEES 640 or MEES 660 or instructor permission

Teaching Assistant
N/A

Student presentations: At the end of the semester, each student will give a ~15-minute presentation explaining the geological aspects of his/her own research project, or another topic of interest. Topics are due by 10 April via e-mail to the instructors.

Final exam: The final will be an open-book, take-home exam that will be designed to take 1.5 hours, or one class meeting, to complete. It will be due one week after it is assigned, and students are expected to work alone. The final will be cumulative and will provide the opportunity for synthesis of course materials.

Tentative Weekly Course Schedule

Note this schedule assumes Monday and Wednesday meetings in Spring 2019; actual dates will be adjusted when course is scheduled. Students will be assigned to lead paper discussions after the first class meeting; assigned papers will be posted throughout the course.

Date	Day	Lecture#	Topic	Paper	Paper Leader	Due dates
28 Jan	Monday	1	Introduction to course and coastal morphology			
30 Jan	Wednesday	2	Particle properties, shear stress			
4 Feb	Monday	3	Turbulence, velocity profiles			HW1 assigned
6 Feb	Wednesday	4	Particle settling			
11 Feb	Monday	5	Threshold of motion			HW1 due
13 Feb	Wednesday	6	Bedload and bedforms			
18 Feb	Monday	7	Suspended load			HW2 assigned
20 Feb	Wednesday	8	Tides and waves			
25 Feb	Monday	9	Waves (cont.)			HW2 due
27 Feb	Wednesday	10	Aeolian processes			

4 Mar	Monday	11	Intro to eco-geomorphology			HW3 assigned
6 Mar	Wednesday	12	Sediment-vegetation interactions			
11 Mar	Monday	13	River plumes, rating curves			HW3 due
13 Mar	Wednesday	14	Tidal flats and deltas			
18, 20 Mar	Monday, Wednesday	No class – Spring Break!				
25 Mar	Monday	15	Deltas and estuaries			HW4 assigned
27 Mar	Wednesday	16	Marshes			
1 Apr	Monday	17	Marshes (cont)			HW4 due
3 Apr	Wednesday	18	Beaches and dunes			
8 Apr	Monday	19	Barrier islands and lagoons			HW5 assigned
10 Apr	Wednesday	20	SAV and synergies with marshes			Presentation topics due
15 Apr	Monday	21	Rocky coasts			HW5 due
17 Apr	Wednesday	22	Coastal erosion and structures			
22 Apr	Monday	23	Storm impacts – river/estuary			HW6 assigned
24 Apr	Wednesday	24	Storm impacts - coastal			
29 Apr	Monday	25	Human impacts and climate change			HW6 due
1 May	Wednesday	26	Integrating research approaches			
6 May	Monday	27	Student presentations			
8 May	Wednesday		Student presentations			
13 May	Monday		Student presentations			Final assigned
20 May	Wednesday					FINAL DUE

Required textbooks, reading and/or software or computer needs

NA; discussion papers will be assigned throughout the course

Course Communication and Resources

We will be using Moodle (http://moodle.cbl.umces.edu) extensively this semester. All course materials, including homework and exams, will be administered through the website. Handouts with slides will be posted the morning of each day's class; please have these available during class.

Instructors are generally available by e-mail, phone, and in-person during normal working hours; advance notice is appreciated but not required.

Campus Policies

The University of Maryland Center for Environmental Science has drafted and approved of various academic and research-related policies by which all students and faculty must abide.

Please visit http://www.umces.edu/consolidated-usm-and-umces-policies-and-procedures for a full list of campus-wide academic policies.

Course-Specific Policies and Expectations

NA