CEE6840 - Coastal Sediment Transport, Fall '05

School of Civil and Environmental Engineering

Georgia Tech – Savannah

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Class Meeting Time: MW 10:05-11:25, PARB127

Course Contents

Sediment properties and characterization, incipient motion of sediments in unidirectional and oscillatory flows, transport of cohesive and non-cohesive sediments in tidal and surf zone environments, Aeolian transport, indirect and direct measurement of sediment transport, numerical modeling of sediment transport, formation and influence of bedforms, bathymetric and shoreline change.

Prerequisites

Graduate standing; CEE3040 (Fluid Mechanics) or equivalent.

Text

Dean, R.G., and Dalrymple, R.A., 2002. Coastal Processes with Engineering Applications. Cambridge University Press, ISBN 0-521-49535-0.

US Army Corps of Engineers Coastal Engineering Manual (free download; http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=Publications;8).

Grading Policy

Semester exam I- 15% *(see dates on course schedule)*
Semester exam II - 15%
Homework - 25%
Paper Reviews - 10%
Final Exam - 35%

All students must take each exam, including the final. The final exam will be cumulative. All assignments and exams will be graded such that: A=90-100, B=80-89, C=70-79, D=60-69, F=below 60. Using the weights indicated above, each student should be able to calculate their grade at any time.

Attendance

Students should attend each class or obtain information on what was missed. Make-up exams will be scheduled only for excused absences. Students are expected to wait ten minutes if the instructor is late for class.

Homework

Students are welcome to work on homework assignments together; however, each student must submit only his/her own work.

There will typically be weekly homework assignments. Late homework will not be accepted without a valid excuse. Homework will be distributed, submitted, and graded using the Web-based WebCT course tool (webct.gatech.edu).

CEE6840: Coastal Sediment Transport
Course Outline, Fall 2005
School of Civil and Environmental Engineering, Georgia Tech
Course Instructor: Paul A. Work

Date	Lecture No.	Topic	Reading*	Paper Review**	Homework
Mon 8/22	1	Sediment transport examples. Water and sediment properties.	Ch. 1		
Wed 8/24	2	Force on sphere. Dimensional analysis. Particle fall speed.	Ch. 2		
Mon 8/29	3	Shear stress for incipient motion. Shields diagram. Critical velocity approach.	Ch. 3	1	
Wed 8/31	4	Fundamental wave and coastal hydrodynamics	Ch. 5		HW#1 Due
Mon 9/5		**Holiday**			
Wed 9/7	5	Incipient motion under waves. Depth of closure.			
Mon 9/12	6	Transport modes. Coastal hydrodynamics.		2	
Wed 9/14	7	Tides.	Ch. 8		HW#2 Due
Mon 9/19	8	Tides, cont'd.		3	
Wed 9/21	9	Bed load in steady flow conditions.	4.1-4.2		
Mon 9/26	10	Bed load formulations. Unsteady flow.	Ch. 9		
Wed 9/28	11	Total load.			HW#3 due
Mon 10/3	12	Total load; transport outside surf zone.			
Wed 10/5	13	Coastline classification/interpretation.			HW#4 Due
Mon 10/10	14	Longshore sediment transport (LST)		4	
Wed 10/12	15	LST, cont'd. One-line numerical modeling			
Mon 10/17		**Holiday (Fall Break)**			
Wed 10/19	16	Inlets. Cross-shore sediment transport.	Ch. 6		
Mon 10/24	17	Equilibrium beach profiles.		5	

Wed 10/26	18	Applications of equilibrium beach profiles.			HW#5 Due
Mon 10/31	19	Numerical modeling of beach profile evolution.			
Wed 11/2	20	**Exam**			
Mon 11/7	21	Numerical modeling of beach profiles, cont'd. Physical modeling of non-cohesive sediment transport.		6	
Wed 11/9	22	Physical modeling, cont'd.			
Mon 11/14	23	No class	Ch. 10	7	
Wed 11/16	24	Cohesive sediments.			HW#6 Due
Mon 11/21	25	Cohesive sediments, cont'd.	11.1-11.2	8	
Wed 11/23	26	Estuary sedimentation.	Ch. 7		
Mon 11/28	27	Estuaries, cont'd.		9	
Wed 11/30	28	Optical measurement of suspended sediments.			HW#7 Due
Mon 12/5	29	Acoustic measurement of suspended sediments.	Ch. 13		
Wed 12/7	30	Large-scale modeling.			HW#8 due
Mon-Fri 12/12-12/16		**Final Exams**			

*All reading assignments in Dean and Dalrymple (2002) unless otherwise noted.
**Papers will be reviewed by a student on the assigned days. All students will read each paper.