Course Title: Modeling Coastal Morphology

Instructor: Professor Ad Reniers

Term offered: Fall 2008

Course description: Represent the coastal morphodynamic system by means of model formulations cast in finite difference equations that are subsequently solved on a (desktop) computer. Understand the potential interactions between wave and flow dynamics and the morphological response of the nearshore coast. Emphasis is on the morphological changes occurring on the storm time scale, e.g. dune erosion, sand bar dynamics, rip channels and overwash events. Students will learn to set-up their own model configurations and become familiar with wave, flow and sediment transport modeling.

Credits: 3 (600 level) AUP 694

Pre-requisites: Elementary knowledge of wave and fluid mechanics. Knowledge of MATLAB and/or FORTRAN is a pre.

Grading: Mid-term exam 25%
Project 50%
Final exam 25%

Sample of specific topics covered (# of weeks in parenthesis):
Tides and Waves (1)
Wave-and wind driven currents (1)
Sediment transport principles (1)
Morphology (1)
Coastline models (1)
Profile models (1)
Area models (2)
Modeling strategies (1)
Modeling-Data comparisons (1)
Project reports (2)