Nearshore Hydrodynamics

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Textbook: **Introduction to Nearshore Hydrodynamics. Ib A. Svendsen, World Scientific, 2006**
ISBN 981-256-204-4 (pbk)

COURSE GRADING:

Homework	**25%**
Paper Reviews	**25%**
Term Project	**50%**

Homework
Approximately 4-5 homework sets will be assigned. Students are welcome to discuss homework problems; however each student must submit only their own work. Copying from other students or any other source (ie solution manuals or old homework solutions) is a violation of the Georgia Tech Honor Code (http://www.honor.gatech.edu) and will be treated as such. You are also allowed (and encouraged) to ask questions, although you should first spend some time thinking about the problems before asking for help. Generally, you will have one week to complete each assignment and no late homework will be accepted without a valid excuse before the due date.

Paper Reviews
We will review 3-4 papers during the semester. Each student will write a 1-2 page critical review of each paper and will be assigned a section of the paper to present to the class. The purpose of the presentation is to promote discussion about the key points within the paper. Grades will be based on the critical reviews, presentations as well as participation in the class discussions.

Term Project
The term project will consist of original research on a subject related to nearshore hydrodynamics. Topics related to students ongoing research interests are highly encouraged. A 1-2 page proposal about the project topic will be due the fourth week. An outline of the project including a thorough literature review about previous work related to the topic will be due the eighth week of the semester. The final project is due at the end of the semester consisting of a 20-minute oral presentation to the class and a-10 page written paper.

COURSE CONTENT

1. Time-averaged properties of linear waves, radiation stresses, volume flux, energy flux
2. Review of Turbulent Flow: Reynolds averaging
3. Depth integrated, wave averaged equations
4. Solutions for wave setup and longshore currents
5. Conservation of energy, wave averaged and turbulent averaged equations,
6. Dynamic properties of breaking waves, measurements and empirical descriptions
7. Wave boundary layers, 1st and 2nd order solutions, steady streaming, combined wave and current boundary layers
8. Cross-shore circulation, undertow, measurements and models
9. Time varying currents and infragravity waves
10. Shear waves and far-infragravity waves
11. Rip currents and nearshore vorticity generation