Linear Ocean Surface Wave Mechanics

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Text: WATER WAVE MECHANICS FOR ENGINEERS AND SCIENTISTS. Robert G. Dean and Robert A. Dalrymple
World Scientific, 1991 ISBN 981-02-0421-3 (pbk)

COURSE GRADING:

Homework	**30%**
Midterm	**30%**
Comprehensive Final Exam	**40%**

Homework
Homework will be assigned on a nearly weekly basis. 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 spend some time and try to think 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. One of the assignments will involve laboratory measurements of waves in a flume with the goal of learning how to separate reflected from incident waves.

Exams
There will be two exams, a midterm and final exam. Both exams will be take-home with duration of 24 hours. The exams will be open book and open note, however, confined to the course notes and course textbook only.

COURSE CONTENT

Weeks	Topic
1	Review of fluid mechanics, mathematic concepts and tensor notation
1-2	Boundary value problem for water waves, governing equations, boundary conditions
2	Linearized problem for small amplitudes using perturbation solutions
2-3	Basic solutions and wave properties, wave kinematics and wave averaged properties
3-4	Wave energy and energy flux concepts and applications, Waves in 2 horizontal directions, wave refraction
5	Wave boundary layers, laminar and turbulent, porous bottom
6	Wave current interaction, wave blocking
7	Wavemaker theory, piston, flap and snake type
8-9	Waves in slowly varying domains
10	Combined refraction diffraction, mild-slope equation
11-12	Nondispersive long waves, waves with Coriolis forcing, seiching, diffraction of long waves
13	Edge waves
14	Wave forces on cylinders and vertical walls
15	Wave statistics and spectra