



UNIVERSITY OF MICHIGAN
Department of Civil & Environmental Engineering
Free-Surface Flow - CEE 621
Fall 2009

Instructor: Nikolaos D. Katopodes
Lecture: TuTh 11:30-1:00, 2305 G. G. Brown
Office Hours: TuTh 1:00-2:30, 121 EWRE
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Text: Chapters from *Free-Surface Flow* by ndk (to be distributed)

Grading: Reading 20%, Homework 40%, Project 40%

Honor Code:

The honor Code is based on integrity, a characteristic that is built into the profession. It is reflected in the original and reliable work of all good engineers. When students accept the Honor Code, they acknowledge that it is dishonorable to receive credit for work which is not the result of their own efforts.

Outline of Course:

1. Conservation laws for incompressible flow
2. Gravitational effects
3. Shallow-water approximation
4. Turbulence models - Reynolds averaging; Large Eddy Simulation
5. Boundary conditions at a free surface
6. Deforming grid methods
7. Free surface computation in ideal flow
8. Waves in open channels – Sigma coordinates
9. Wave run-up on beaches
10. Stratified flow – surface and internal waves
11. Particle methods - dam break wave
12. Volume of Fluid Method – Geometric reconstruction
13. Level Set method
14. Fluid - structure interaction