ME453A: Finite Element-Based Modeling & Simulation of Linear Fluid/Structure Interaction Problems

Schedule: Winter 0X, Tu-Th 11:00 am – 12:30 pm Units 3

Course Description
A Ph. D.-level course for graduate students interested in understanding the basic physics behind many fluid/structure interaction phenomena, and learning finite element-based computational approaches for modeling and simulating them in the frequency domain. The course covers introductory material pertaining to a class of linear fluid/structure problems characterized by a long duration of the interaction and limited fluid displacements.

Course Outline
Vibrations of elastic structures - Linearized equations of small movements of inviscid fluids - Sloshing modes - Hydroelastic vibrations - Acoustic cavity modes - Structural-acoustic vibrations (interior and exterior problems) --- Applications to the design of liquid containers and analysis of underwater signatures.

Prerequisites
A graduate course in the Finite Element method or Instructor’s consent.

Textbook
Lecture notes and various reading materials.

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