CE 723: Advanced Structural Dynamics, Fall 2014

Objectives: In this course students will learn to:
(1) create, analyze, test, verify, and critique the analytical models of structural systems subjected to dynamic loads
(2) read and understand the state-of-the-practice methods, software, codes, technologies, devices, etc. used in the design of structural systems subjected to dynamic loads.

Times and Location:
Fall 2014, Tuesday/Thursday, 1:30 pm – 2:45 pm
Location: Mann Hall Room 406 (EOL Studio)

Instructor: Dr. Abhinav Gupta, 413 Mann Hall
Phone: 515-1385, E-mail: agupta1@ncsu.edu

Suggested Texts (Not Required):


Copies of published papers and professional articles will be distributed.

Grading: Homework 60%
Term Paper/Project 15%
Project 15%
Final 10%

Software Requirements:
We will use MATLAB, but students will only modify EXISTING programs. The student version of MATLAB is acceptable. Students will also use SAP2000, a student version.

Outline: Equations of motion for symmetrical & unsymmetrical structures
Response to dynamic loads - direct integration & modal superposition
Damping models- Rayleigh, modal, hysteretic, & non-classical.
Mode truncation
Response spectrum method
Design Spectrum
Combination of modal responses
Uniform Building Code
Seismic analysis and design of nonstructural systems
Detailing requirements in seismic design of structures
Base isolation and supplemental damping devices