

LEHIGH UNIVERSITY  
Department of Civil & Environmental Engineering

## CEE352, Structural Dynamics Fall Semester, 2012

**Instructor:** Shamim Pakzad, ATLSS Center, Room B208, (610)758-6978  
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**Class Time and Location:** Tuesday & Thursday 2:20-3:40 PM, at B101 Imbt Lab

**Office Hours:** Tuesday 10:50-11:30 AM at FL 306, Wednesday 10:00-11:00 AM ATLSS

**Text:** *Dynamics of Structures: Theory and Applications to Earthquake Engineering*, by A. K. Chopra, Prentice Hall, Fourth Edition, 2012.

**Prerequisites:** CEE 159, MATH 205, MECH 102

### Conduct of Course

**Problems:** Homework problems will be assigned from the textbook every week and will be due in a week. Problem solutions must be submitted on 8 1/2 x 11 in. engineering computation paper, stapled at the upper left corner and the student's name should appear on each page. Principal results must be clearly identified. The units used must be those of the problem statement. Untidy solutions will not be accepted.

In some cases it is expected that MATLAB computer program will be used as an aid to the problem solution, but the problem statement and results must be presented in a complete and readily understood format (generally by hand on engineering computation paper). Only significant, easily interpreted parts of the computer output should be included in the problem solution.

Late assignments will not be accepted.

**Examinations:** One midterm of 75 minutes duration and a final exam of three hours duration will be scheduled. One page of formulas and equations is permitted as reference in the final exam, and one side of one page for the midterm exam.

**Term Project:** The term project consists of literature review and research on a topic related to structural dynamics. A symposium for presentation of the papers may be organized at the end of the semester.

**Grading:** Homework - 30%      Midterm exam - 30%      Final exam - 40%  
Term Project & Lab report - 10% (EC)

**Key to grades:**

A, A-	Excellent
B+, B, B-	Good
C+, C	Competent
C-	Continuation competency
D+, D, D-	Passing
F	Failure

**Tentative Course Outline and Schedule**

**Reading Assignment**

1. Course Introduction and Motivation
2. Single-Degree-of-Freedom Systems
  - a. Equations of Motion 1.1-1.11
  - b. Free Vibration 2.1-2.3
  - c. Harmonic Excitation 3.1-3.6, 3.8,3.9
  - d. Arbitrary, Step and Pulse Excitations 4.1-4.12
  - e. Numerical Evaluation of Dynamic Response 5.1-5.5
  - f. Generalized Single-Degree-of-Freedom Systems 8.1-8.6
3. Multi-Degree-of-Freedom Systems
  - a. Equations of Motion 9.1-9.3, 9.9-9.11
  - b. Free Vibration; Natural Vibration Frequencies and Modes 10.1-10.10
  - c. Dynamic Analysis of Linear Systems 12.1, 12.3-12.7

**Accommodations for Students with Disabilities:** If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center 212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.

**Academic integrity:** There is a zero-tolerance policy for any violation of academic integrity. It is expected that each student will do the homework assignments and other course-related projects independently. Collaboration in the preliminary stages of each problem is permitted and encouraged. Each student assumes responsibility for every assignment or examination that he/she submits.