

# Vibration and Shock, MAE 467/567

## Spring 2003

**Instructor:** Dr. R. C. Wetherhold, 606 Furnas, [mecrew@acsu.buffalo.edu](mailto:mecrew@acsu.buffalo.edu),  
645 2593 x2241

**Office time:** MW 3:00-4:30 (to be confirmed) *and by appointment* (meant to be encouraging, not discouraging)

**TA, office times:** Tung King See, [tungsee@eng.buffalo.edu](mailto:tungsee@eng.buffalo.edu); 3:30-4:45 TR.

**Web location:** <http://www.eng.buffalo.edu/Courses/mae467> for hw solutions, test solutions, extra notes, etc.

**Class time, location:** M W F, 12:00 - 12:50 from 1/13/2003 - 4/28/2003, 260 Capen

**NOTE:** We may schedule 2 or so Problem Sessions outside of class;

**Text:** WT Thomson, MD Dahleh, Theory of Vibration with Applications, 5<sup>th</sup> ed (1998).

**Course Objective:** This course should enable you to model and analyze the vibration behavior of single- and multiple-degree of systems as well as of simple continuous systems (beams). At the end of this course, you should be familiar with:

- Derivation of equations for free and forced vibration of lumped parameter systems in steady-state and transient conditions, including damping;
- Solution methods, primarily analytical, for these equations and insight into the design variables
- The use of energy methods, including Lagrange's equations
- Derivation of equations for continuous systems and their solutions

**The topics to be covered are as follows\*:**

Chapter	Sections	Contents
1	all	Oscillatory motion
2	all	Free vibration
3	all	Harmonically excited vibration
4	1 to 6	Transient vibration
5	all	Systems with two or more DOF
6	selected	Properties of vibrating systems
7	all	Lagrange's equation
9	selected	Vibration of continuous systems
12	selected	Classical methods

**Word to the Wise:** Be active on your own behalf! Review what I do and come to class prepared to ask questions.

**Grades and Grading Policies\*:**

3 (equal) In-class Tests	90% (Grad students may have extra problems)
Homework	10%

**Test Schedule\*:** Current plans are to hold Test #1 on 2/21 on material through 2/14, Test #2 on 4/2 on material through 3/26 and Test #3 either on 4/28 or (more likely) at the scheduled finals time.

\* means that these items are subject to change on minimum of 1 week notice.

**Homework:** *“Homework is where the learning occurs.”*

Do not to allow HW to pile up, since completing it is necessary to keeping up with the class. No extensions will be given for the HW due dates; it is best to hand in what you have completed. Homework is due at the **beginning** of class. (That means 12:00, right?) I may grade all or part of the homework. You may be asked to present problems before the class.

**Other notes:** If you must miss a test or homework, you should come to me or contact me **before** the date. If you are ill, get a medical proof.

**Academic Honesty:** This is the beginning of your professional career, and there are standards to be observed. Any dishonesty in any form (cheating, plagiarism, etc) is grounds for your receiving an F in this course; I may also pursue additional measures as allowed for by the University.