

CVET-437-01 Principles of Dynamics in CET *Spring 2018*

Instructor: **Dr. Amanda Bao, P.E.**

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Lecture: **M, W: 9:05-10:00am, Room ENT-3185**

Office Hours: **T: 2:30-3:30pm; W: 1:30-2:30pm; F: 11:00am-Noon in ENT-3154**

Learning Assistant and Grader: **Zaima Zeniya (zzz6775@rit.edu)**

Learning Assistant's Office Hour: **T: 10:00am-12:00pm; R: 4:00-5:30pm in ENT-Lobby**

Text:

Hibbeler, R. C., Engineering Mechanics - Dynamics, 14th Edition, Pearson, 2016

Prerequisites:

MATH-172 and CVET-332

Intended Learning Outcomes:

After completing this course, you will be able to:

1. Understand the basic principles of kinematics and kinetics of particles and their applications to vibrations and structural dynamics.
2. Understand and define basic vibrations and dynamics terminology, e.g. natural frequency, period, damping, etc.
3. Model structural systems using single-degree-of-freedom (SDOF) models, and carry out simple vibration and dynamic analysis of structures.

Course Outline:

1. Kinematics of a particle (6 lectures)
2. Force, mass and acceleration (5 lectures)
3. Work and energy (4 lectures)
4. Impulse and momentum (3 lectures)

5. Vibrations: free vibration and forced vibration (6 lectures)
6. Introduction to seismic force and shake table testing (2 lectures)
7. Tests (2 lectures)

Course Web Site, Online Discussions, and E-mail:

The course web site at <http://mycourses.rit.edu> will mainly be used to post handouts, homework and test information. Screencasts are available on the web site: <http://baoteachingcet.com>. (Screencasts Access: **Username: test, Password: 1234**) Some announcements relating to this course may be sent to you via e-mail.

Conduct in Lectures:

Please be on time and conduct yourself in a respectful and professional manner in class. Students will refrain from wearing headphones, earpieces, or other audio devices during class. Laptops can only be used during class for note-taking purposes. Cell phones, pagers, texting devices, I-pods, etc. should be set to silent mode.

Homework Assignments:

Homework assignments can be carried out in a group of 2 students or individually if preferred. Hands-on lab assignment (building models) will be done a group of 4-5 students. Students are encouraged to form their own groups. Homework assignment will be posted on the course website at <http://mycourses.rit.edu>.

- ✓ **Homework problems are due by 4pm on the assigned due date. No late homework will be accepted or graded.**
- ✓ Calculations should be neat and organized. Sketches, assumptions, units, and references must be included, where appropriate. Show all works in details. Use Engineering paper only, write on one side and box your solutions. All numerical values shall include the appropriate units. Points will be deducted from the assignment grade if this format is not followed.
- ✓ No point will be given for work that has been copied from other students or resources.
- ✓ Assignments will be graded and handed back within one week.
- ✓ Homework will be assigned group grades.
- ✓ Solutions to the homework assignments will be posted in the display case outside CETEMS office.

Homework Assignments Schedule:

Homework #	Handout Date	Due date	Content
1	Wed, 1/17	Wed, 1/31	Acceleration, velocity, displacement
2	Wed, 1/31	Wed, 2/7	Acceleration, velocity, displacement
3	Wed, 2/7	Wed, 2/14	Absolute dependent motion and relative motion
4	Wed, 2/14	Mon, 2/26	Equations of motion: rectangular coordinates
5	Mon, 2/26	Wed, 3/7	Equations of motion: normal and tangential coordinates
6	Wed, 3/7	Mon, 3/19	Principle of work and energy
7	Mon, 3/19	Wed, 3/28	Conservation of mechanical energy
8	Wed, 3/28	Mon, 4/9	Impulse and momentum
9	Mon, 4/9	Mon, 4/23	Shake table testing (model)
10	Mon, 4/16	Tue, 5/1	Vibration

Exams:

There will be **two 55-minute tests and a final exam** in this course, and all exams are open book and open notes. No make-up tests will be given except in **very extenuating** circumstances and only if the instructor is given prior notice. **All tests will not be returned** but you are welcome to look through your graded test booklet in my office.

Exams Schedule:

Exam #	Date	Covers HW #
1	Wed. 2/28/18	1, 2, 3
2	Wed. 4/11/18	4, 5, 6, 7
Final Exam	Finals week	All

Grade Distribution:

Homework	= 20%
Lab (Shake Table Testing)	= 5%
Two 50-minute tests @ 20% each	= 40%
2-hour Final Exam	= 35%

Letter Grades:

The letter grades in this course will be assigned as follows:

A	=	93-100
A-	=	90-92
B+	=	87-89
B	=	83-86
B-	=	80-82
C+	=	77-79
C	=	73-76
C-	=	70-72
D	=	60-69
F	=	Below 60