CVET-437-01 Principles of Dynamics in CET

Spring 2021

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

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Lecture: **M, W: 9:05-9:55am, Room GOL (70)-1400**

Office Hours: **M: 3:00-4:00pm; W: 2:00-3:00pm; F: 10:00-11:00am through Synchronous Zoom Video Conference: https://rit.zoom.us/j/98242643431**

Topic: Dr. Bao's Office Hour-Zoom Meeting
Time: 3:00-4:00pm on Monday, 2:00-3:00pm on Wednesday, 10:00-11:00am on Friday

Join Zoom Meeting
https://rit.zoom.us/j/98242643431

Meeting ID: 982 4264 3431

One tap mobile
+16465588656,,98242643431# US (New York)
+13126266799,,98242643431# US (Chicago)

Text:

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

Prerequisites:

CVET-332 and MATH-172 or 1016-232 or equivalent course.

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 (7 lectures)
2. Force, mass and acceleration (4 lectures)
3. Work and energy (4 lectures)
4. Impulse and momentum (2 lectures)
5. Vibrations: free vibration and forced vibration (7 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. Class example 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. Synchronous online Zoom video conference will be used for office hours.

Conduct in Lectures:

Please be on time and conduct yourself in a respectful and professional manner in class. Keep 6ft distance between students and the instructor and wear a mask. Cell phones, pagers, texting devices, I-pods, etc. should be set to silent mode.

Homework Assignments:

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. Scan and upload the electronic copy to the homework dropbox under the tab "Assignments" on myCourses. 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. Write on one side and highlight 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 within one week.
- ✓ Solutions to the homework assignments will be posted on myCourses.

Homework Assignments Schedule:

Homework #	Handout Date	Due date	Content
1	Wed, 1/27	Wed, 2/3	Acceleration, velocity, displacement
2	Wed, 2/3	Wed, 2/10	Acceleration, velocity, displacement
3	Wed, 2/10	Wed, 2/24	Absolute dependent motion and relative motion
4	Wed, 2/24	Wed, 3/10	Equations of motion: rectangular coordinates
5	Wed, 3/10	Wed, 3/17	Equations of motion: normal and tangential coordinates
6	Wed, 3/17	Wed, 3/31	Principle of work and energy
7	Wed, 3/31	Wed, 4/7	Conservation of mechanical energy
8	Wed, 4/7	Wed, 4/21	Impulse and momentum
9	Wed, 4/21	Wed, 5/5	Vibration

Exams:

There will be **two 50-minute tests and a 150-minute 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. 3/3/2021	1, 2, 3
2	Wed. 4/14/2021	4, 5, 6, 7
Final Exam	Finals week (TBD)	All

Grade Distribution:

Homework	= 20%
Shake Table Testing	= 5%
Two 50-minute tests @ 20% each	= 40%
2.5-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