TED UNIVERSITY

CE 212
Engineering Mechanics II

SYLLABUS/SPRING 2019

Course Information

Required or Elective	☑Required ☐Elective	**Date Prepared**	February 2019
Semester	Spring 2019	**Class Hours and Classrooms**	Wed. 14:00 – 15:50 (G010) **S1**, Fri. 12:00 – 13:50 (G112) **S1** Wed. 17:00 – 17:50 (G010) **S2**, Fri. 13:00 – 13:50 (G112)**S2**
Course Credit Hours/ ECTS credits	(3+0+0) 3 / 5	**Pre-requisite/ Co-requisite**	CE211
Level of Course	Sophomore	**Language of Instruction**	☑ English ☐ Turkish
Instructors and their office hours	Dr. Rıza Secer Orkun Keskin (secer.keskin@tedu.edu.tr) (Rm. D313) Office hours: TBA Please make an appointment through e-mail for other times.		
Teaching Assistant(s)	Mert Tunalı (Rm. GB18)		
Textbook	Engineering Mechanics: Dynamics by R.C. Hibbeler, 14th Edition, Prentice Hall, 2015.		
Recomended Readings	1) Vector Mechanics for Engineers: Dynamics by F. Beer, E.R. Johnston, P. Cornwell, 10th Edition, McGraw-Hill, 2012. 2) Engineering Mechanics 3: Dynamics by D. Gross, W. Hauger, J. Schroder, W.A. Wall, J. Bonet, 2nd Edition, Springer, 2014. 3) Engineering Mechanics: Dynamics by J.L. Meriam, L.G. Kraige, 7th Edition, Wiley, 2013. 4) Engineering Mechanics: Dynamics by M. Plesha, G. Gray, F. Costanzo, 2nd Edition, McGraw-Hill, 2012.		
Course Web Pages	We have already added all of you to the course web page on Moodle http://moodle.tedu.edu.tr. Please follow this course web page regularly to have access to the posted course materials and announcements.		

Course Description

Kinematics of particles and rigid bodies: absolute motion, relative motion. Kinetics of particles: equations of motion, work-energy and impulse-momentum. Systems of particles. Kinetics of rigid bodies: Euler's equation, plane motion of rigid bodies, kinetic energy of rigid bodies. Introduction to the dynamics of vibrating systems.

Course Objective

This is an introductory level course on motion of rigid bodies and forces that cause motion. In this course, Newton's Laws, energy and momentum principles will be explored and dynamic behavior of undamped single degree of freedom systems will be covered.

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. model 2D motion of system of particles and rigid bodies by employing kinematic relationships, **(B3)**
2. apply Newton's equations to 2D dynamic problems to determine forces resulting from specified motions of system of particles and rigid bodies, **(B3)**
3. explain the difference between static and kinetic friction, **(B2)**
4. Model 2D motion of particles and rigid bodies using energy and momentum principles, **(B3)**
5. recognize the difference between free and forced type vibrations, **(B1)**
6. recognize the difference between damped and undamped single degree of freedom systems, **(B1)**
7. apply Newton's equations of motion and energy methods to 2D dynamic problems to describe vibrations of single degree of freedom rigid bodies. **(B3)**

Course Assignments

A. ***Homework (10%):*** A number of problem sets will be assigned throughout the semester.
B. ***Midterm Exams (60%):*** There will be three midterm exams.
C. ***Final (30%):*** There will be a cumulative final exam.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Homework	All
Midterm Exam I	#5, #6, #7
Midterm Exam II	#1, #2, #4
Midterm Exam III	#1, #2, #3, #4
Final Exam	#1, #2, #3, #4, #7

Relationship to Program Outcomes

This course contributes to fulfillment of the following program outcomes:

ii. Apply knowledge of mathematics, science, and engineering to design and implement original, innovative and sustainable civil engineering systems or processes to meet desired needs within a greater societal context

vi. Identify, formulate, and solve engineering problems

Tentative Course Lectures Outline

A tentative course outline for the lectures is given below. Any changes and updates will be announced on the Moodle web page for the course.

Week	Topics
1	Kinematics of a Particle: Rectilinear Motion, Curvilinear Motion
2	Kinematics of a Particle: Curvilinear Motion, Dependent Motion, Relative Motion
3	Kinetics of a Particle: Force and Acceleration
4	Kinetics of a Particle: Work, Power and Efficiency **Midterm #1**
5	Kinetics of a Particle: Conservation of Energy
6	Kinetics of a Particle: Principle of Impulse and Momentum, Conservation of Impulse and Momentum
7	Kinetics of a Particle: Impulse and Momentum, Impact
8	Planar Kinematics of a Rigid Body: Translation, Rotation about a Fixed Axis, Relative Motion Analysis of General Plane Motion: Velocity **Midterm #2**
9	Planar Kinematics of a Rigid Body: Relative Motion Analysis of General Plane Motion- Velocity, Acceleration
10	Planar Kinetics of a Rigid Body: Translation, Rotation about a Fixed Axis
11	Planar Kinetics of a Rigid Body: General Plane Motion
12	Planar Kinetics of a Rigid Body: Work and Energy **Midterm #3**
13	Vibration
14	Vibration

Course Policies and Some Remarks

Attendance

In order to be admitted to the final examination, a student **must have attended at least 75% of the lectures and must have submitted at least 75% of the given assignments**. Students not fulfilling these conditions will not be permitted to enter the final examination. Students not given the

permission to take the final examination will automatically receive the grade FX at the end of the semester.

Calculator Policy

You may use a calculator during exams.

Plagiarism

Collaboration on non-collected homework and in studying is strongly encouraged; however, the work you hand in must be solely your own. Sharing written work before it is turned in to be graded is academic dishonesty. For more information on TEDU policy on intellectual integrity see the TEDU student handbook.

Disability Support

If you have a disabling condition which may interfere with your ability to successfully complete this module, please contact the coordinator of the TEDU Disabled Students Committee (email: onur.ozmen@tedu.edu.tr). For more information please see Handbook for Registered Students.

Make Up Exams

Make-up exams for midterm exams will NOT be offered. The only exceptions are illness or emergency (e.g., death in family, a traffic accident, etc.). In case of an illness or emergency you need to supply a documentation that supports your claim.

Also please read the document given in the link http://www.tedu.edu.tr/tr/main/yonetmelikler-ve-yonergeler

Late Homework

For each day after the announced deadline, 25% of the total earned mark will be deducted.