TED UNIVERSITY

CE 212
Engineering Mechanics II

SYLLABUS/SPRING 2021

Course Information

Required or Elective	☑Required ☐Elective	**Date Prepared**	February 2021
Semester	Spring 2021	**Class Hours and Classrooms**	Mon. 16:00 – 17:50 Wed. 12:00 – 12:50 Lectures will be held on regular time through Zoom platform.
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	Assoc. Prof. Dr. Rıza Secer Orkun Keskin, E-mail: secer.keskin@tedu.edu.tr; Room: D313 Office Hour: Tue 16:00-17:00 (via Zoom) Please get an appointment by e-mail to visit me in the office.		
Teaching Assistant(s)	-		
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 Assignments (10%):*** A number of problem sets will be assigned.
B. ***Quizzes (20%):*** A number of quizzes will be given.
C. ***Short-time assignments (20%):*** Two short-time assignments will be given.
D. ***Midterm exam (20%):*** A face-to-face (or online) mid-term exam will be given.
E. ***Final Exam (30%):*** A cumulative face-to-face (or online) final exam will be given.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Homework	All
Quizzes	All
Short-time Assignments	All
Mid-term Exam	#1, #2, #3, #4
Final Exam	All

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
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
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
13	Vibration
14	Vibration

Course Policies and Some Remarks

Attendance

In order to be admitted to the final examination, a student must submit at least 80% of the given assignments, attend at least 80% of the quizzes and take the mid-term exam. Students not fulfilling these conditions will not be permitted to take 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.

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.

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 (https://student.tedu.edu.tr/en/student/principles-of-academic-integrity).

Specialized Support and Students with Disabilities

Students who may require specialized support due to a disability affecting mobility, vision, hearing, learning, mental or physical health should consult with Specialized Support and Disability Coordinator, Asst. Prof. Emrah Keser E-mail: emrah.keser@tedu.edu.tr, or visit the website at https://www.tedu.edu.tr/tr/main/engelsiz-tedu

Student Counseling Centre

The Student Counseling Centre is a service mandated with providing crisis intervention and supportive listening services to the campus community. A major part of fulfilling that mandate is raising awareness of our service so that students know they are never alone in dealing with problems. For further information and/or questions, you can contact Sıla Deniz Beyarslan, sdeniz.beyarslan@tedu.edu.tr, Office 165, or visit SCC website at http://csc.tedu.edu.tr

TEDU COPeS

TED University Coronavirus Psychosocial Support Team was established in order to facilitate coping with the psychological, social, familial, academic, and professional difficulties that may arise due to adverse conditions associated with COVID-19 pandemic for TEDU students and employees. TEDU COPeS aims to provide psychosocial support for TED University students and employees during the coronavirus outbreak. To this end, the team aims to provide support at the early stages of a possible crisis, activate and strengthen your coping strategies, and provide information on support resources. For further information and/or questions, visit their website at https://copes.tedu.edu.tr