TED UNIVERSITY

CE 211
Engineering Mechanics I

SYLLABUS/Spring 2019

Course Information

Required or Elective	☑Required ☐Elective	**Date Prepared**	February 2019
Semester	Spring 2019	**Class Hours and Classrooms**	Mon. 9:00 – 11:50 (D030) **S1** Mon. 9:00 – 11:50 (A423) **S2**
Course Credit Hours/ ECTS credits	(3+0+0) 3 / 5	**Pre-requisite/ Co-requisite**	PHYS105
Level of Course	Sophomore	**Language of Instruction**	☑ English ☐ Turkish
Instructors and their office hours	Prof. Dr. Kağan Tuncay Dr. Rıza Secer Orkun Keskin (secer.keskin@tedu.edu.tr)(Rm. D313) Office hours: Tue 14:00-17:00 Please make an appointment through e-mail for other times.		
Teaching Assistant(s)	Anıl Ekici		
Textbook	Engineering Mechanics: Statics by R.C. Hibbeler, 14th Edition, Prentice Hall, 2015.		
Recomended Readings	1) Vector Mechanics for Engineers: Statics by F. Beer, E.R. Johnston, D. Mazurek, 10th Edition, McGraw-Hill, 2012. 2) Engineering Mechanics: Statics by D. Gross, W. Hauger, J. Schroder, 2nd Edition, Springer, 2013. 3) Engineering Mechanics: Statics by J.L. Meriam, L.G. Kraige, 7th Edition, Wiley, 2011.		
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

Introduction to rigid body mechanics. Equivalent force systems: Concepts of moment, couple, resultant. Equilibrium: Free-body diagram; equations of equilibrium. Structural analysis: Trusses; beams. Shear force and bending moment diagrams by method of sections and by method of integration. Properties of surfaces: Area moment and centroid; moments and product of inertia; principal directions.

Course Objective

Mechanics is the physical science that deals with the effects of forces on objects. Mechanics can be divided into three main branches: rigid-body mechanics, deformable-body mechanics, and fluid mechanics. This course is an introductory level course on rigid-body mechanics. The objective of this course is to introduce students to the fundamental concepts and principles employed by engineers - whether civil, mechanical, aeronautical, etc. - in the design of structures of all sorts, sizes and purpose.

Course Learning Outcomes

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

1. apply vector algebra to engineering mechanics problems, **(B3)**
2. prepare free body diagrams of 2D and 3D rigid bodies, **(B3)**
3. apply Newton's 1st law of motion to 2D and 3D rigid bodies, **(B3)**
4. explain the difference between truss and frame type structures, **(B2)**
5. distinguish statically determinate truss and frame type structures, **(B2)**
6. compute internal forces and support reactions in 2D and 3D statically determinate trusses, **(B3)**
7. compute internal forces and support reactions in statically determinate beams and frames, **(B3)**
8. determine properties of surfaces such as center of gravity, centroid of an area; moment of inertia, product and polar moment of inertia of an area, **(B3)**
9. compute single force equivalents of distributed 2D and 3D force systems. **(B3)**

Course Assignments

A. ***Homework and Quizzes (15%):*** A number of problem sets will be assigned throughout the semester. These will contribute towards 10% of the total grade. Quizzes given will contribute towards another 5% of the total grade.
B. ***Midterm Exams (50%):*** There will be three midterm exams.
C. ***Final (35%):*** There will be a cumulative final.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Homework and Quizzes	All
Midterm Exam I	#1, #3
Midterm Exam II	#2, #3, #4, #5, #6, #9
Midterm Exam III	#2, #3, #6, #7
Final Exam	#2, #3, #6, #7, #8

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	General Principles (Sections from textbook 1.1-1.6)
2	Force Vectors (2.1-2.9)
3	Force System Resultants (4.1-4.9)
4	Force System Resultants (4.1-4.9)
5	Equilibrium of a Particle (3.1-3.4) **Midterm #1**
6	Equilibrium of a Rigid Body (5.1-5.7)
7	Structural Analysis (6.1-6.6)
8	Structural Analysis (6.1-6.6)
9	Structural Analysis (6.1-6.6) **Midterm #2**
10	Internal Forces (7.1-7.3)
11	Internal Forces (7.1-7.3)
12	Internal Forces (7.1-7.3)
13	Center of Gravity and Centroid (9.1-9.3, 9.5) **Midterm #3**
14	Moment of Inertia (10.1-10.5)

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.