

TED UNIVERSITY

CE 211

Engineering Mechanics I

SYLLABUS/Spring 2020

Course Information

Required or Elective	<input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective	Date Prepared	February 2020
Semester	Spring 2020	Class Hours and Classrooms	Mon. 16:00 – 16:50 (F317) Tue. 11:00 – 12:50 (F314) Lectures will be held on regular time through Zoom platform.
Course Credit Hours/ ECTS credits	(3+0+0) 3 / 5	Pre-requisite/ Co-requisite	PHYS105
Level of Course	Sophomore	Language of Instruction	<input checked="" type="checkbox"/> English <input type="checkbox"/> Turkish
Instructors and their office hours	Assoc. Prof. Dr. Rıza Secer Orkun Keskin (secer.keskin@tedu.edu.tr) Please contact through e-mail.		
Teaching Assistant(s)	Büşra Yıldırım; Please contact through e-mail.		
Textbook	Engineering Mechanics: Statics by R.C. Hibbeler, 14th Edition, Prentice Hall, 2015.		
Recommended Readings	1) Vector Mechanics for Engineers: Statics by F. Beer, E.R. Johnston, D. Mazurek, 10 th Edition, McGraw-Hill, 2012. 2) Engineering Mechanics: Statics by D. Gross, W. Hauger, J. Schroder, 2 nd Edition, Springer, 2013. 3) Engineering Mechanics: Statics by J.L. Meriam, L.G. Kraige, 7 th 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 (15%):** A number of problem sets will be assigned throughout the semester. Depending on the performance of the class pop-up quizzes may be given.
- B. **Quizzes (25%):** A number of online quizzes will be given.
- C. **Overnight Assignments (60%):** Three assignments will be given. The deadline for submission will be decided according to the problems in the assignment.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Homework	All
Quizzes	#3, #4, #5, #6, #7, #8, #9
Overnight Assignments	#3, #4, #5, #6, #7, #8, #9

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)
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)
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)
14	Moment of Inertia (10.1-10.5)

Course Policies and Some Remarks

Attendance

My observations show that a student with a high attendance rate is likely to get a good grade. On the contrary, failure rate rapidly increases among those students who attend less than 70 percent of all lectures. In order to get a good grade, it is strongly advised not to miss any course.

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 Student Activities Specialist at Dean of Students Office Mr Peyman Jaferi, (email: peyman.jaferi@tedu.edu.tr, phone: (312) 585-0132) or Assist. Prof. Dr. Onur Özmen (email: onur.ozmen@tedu.edu.tr, phone: (312) 585-0206). 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.