ME-302 Mechanical Systems II
SPRING 2021

Instructor: Eralp Demir
E-mail: eralpd@sabanciuniv.edu
Class hours: Tuesday 5:40-17:30
Zoom ID: 465 324 4758
TAs:
Ali Rashed (rashed) Thursday (16:40-17:30) ME302-L-A
Can Bayraktar (canbayraktar) Friday (10:40-12:30) ME302-L-B
Celal Umut Kenanoglu (umut.kenanoglu) Thursday (12:40-14:30) ME302-R-A
Fiyinfoluwa Abioye (fabioye) Thursday (14:40-16:30) ME302-R-B

Office Hours: After class, or by appointment

Main References:

Objectives: This course intends to give design and engineering principles of machine elements for undergraduate students.

Prerequisites: ME-301

Tentative Course Outline:

Week-1: Basics of Machine Design
Introduction
Materials
Stress Analysis
Deflection and Stiffness
Week-2: Failure Analysis
Static Strength and Failure
Fatigue Failure
Week-3/12: Design of Mechanical Elements
Design principles related with the machine elements
Week-3: Design of Shafts
Week-4: Design of screws, fasteners, non-permanent joints
Week-7: Design of welds, bonds, and permanent joints
Week-8: Mechanical springs
Week-9: Rolling contact bearings
Week-10: Gears
Week-11: Flexible Machine Elements
Week-12: Power Transmission
Week-13: Finite Element Method
Generalized FEA for static linear elasticity; Basic Finite Element Principles; Stress Analysis using a commercial software (Solidworks).
Learning Outcomes:

- Ability to perform design of machine elements
- Decision making for selection of machine elements
- Strength and Failure analysis considering static and fatigue load conditions
- Ability to solve basic engineering problems with the use of a commercially available software

Computer Programming: MATLAB, ANSYS

Grading Policy: Assignments (30%), Project (20%), Midterm (20%), Final (30%).

Important Dates: will be announced

Class Policy:

- Regular attendance is essential and expected.
- Quizzes will be done during lab or recitation hours.