

ME 408
Mechatronics System Design
Spring 2023-2024

Lecture Time:

Wednesday 14:40-15:30
Thursday 12:40-14:30

ZOOM Link (for office hours): <https://sabanciuniv.zoom.us/j/3124868824>

Instructor:

Mehmet Mert Gülhan
mert.gulhan@sabanciuniv.edu

Course Objectives:

Mechatronics system design deals with the design of controlled electromechanical systems by the integration of functional elements from a multitude of disciplines. It covers the fundamentals of design and applies it to each discipline by modelling various subsystems. It aims to apply this knowledge to a realistic mechatronics design problem.

At the conclusion of this course, students are expected to

- Model and simulate engineering problems by using certain software tools
- Learn how the systematic engineering design process can support development process of complex, multidisciplinary mechatronic systems
- Synthesize the knowledge and skills gained in their undergraduate classes
- Develop the ability to address a broad range of requirements, including most of the following: performance, economic, environmental, sustainable, manufacturing, and safety

Tentative Schedule

Week	Topic
1	Engineering design process and its phases
2	Mechanical system design review introduction
3	Deflection and static failure theories
4	Assembly elements
5	Fundamentals of kinematics and dynamics
6	Electrical system design review introduction
7	Passive circuit elements
8	DC motors
9	Fundamentals of power electronics
10	Control system design review introduction
11	Basics of control methods
12	Digital control and block diagrams
13	State space and system integration

Course Work:

Assignments mostly consist of introductory exercises for the various software you will be using for your project. The final project is the main load of this course:

- (20%) Assignments
- (30%) Final Project Part 1
- (20%) Final Project Part 2
- (30%) Final Project Part 3

Regarding Academic Honesty:

Although cooperative efforts at understanding the material and the assignments of the course are encouraged, you may only submit work that you have completed individually. Submitting any work that is not the result of a student's own effort is considered cheating and will result in disciplinary action.