**ME 408**
**Mechatronics System Design**
**Fall 2021 – 2022**

**Lecture Time:**
Monday                                   08:40-10:30
Tuesday                                   08:40-09:30
**Online Lectures ZOOM Link will be provided weekly.**

<u>**Instructor:**</u>
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<u>**Course Objectives:**</u>

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

<u>**Tentative Schedule**</u>

| Week | Topic |
|------|-------|
| 1 | Engineering design process and its phases |
| 2 | Mechanical system design introduction |
| 3 | Load determination and analysis |
| 4 | Stress concentration and assembly elements |
| 5 | Fundamentals of kinematics and dynamics |
| 6 | Electronical system design introduction |
| 7 | Embedded computers |
| 8 | Power electronics |
| 9 | Sensors and actuators |
| 10 | Control system design introduction |
| 11 | Dynamic systems |
| 12 | Basics of control methods |
| 13 | System integration |

## Course Work:

A lot of the grade distribution and specifics about the project is subject to change. There are three main parts in the course work:

- (25%) Assignments

- (35%) Midterm Exam

- (40%) Final Project

## 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.