ENGR 4270 – Engineering Capstone Design II (Required)

**Course Description:**  
Two semester hours. The capstone project initiated in ENGR 4260 is taken from a prototype to a finished project. The project then undergoes laboratory testing and evaluation. Students present their results on a research poster and in oral presentations.

**Prerequisites:** ENGR 4260  
**Co-Requisites:** None

**Credits:** 2 Hours  
(Lecture: 3 Hours, Laboratory: 0 Hours)

**Instructor:** Hacer Varol

**Textbook:** None required


**Topics Covered:**  
Prototype construction and experimental testing, problem solving and teamwork skills, Information gathering techniques, failure modes and effect analysis, tolerances in design, engineering ethics, computer aided design and engineering, prototyping methods.

**Course Learning Outcomes**  
By the end of the course, a successful student will be able to:

- Demonstrate knowledge for engineering codes governing detailed design. (SO-7)
- Create a final detailed design from a concept and give ideal methods for widespread application for design in current market. (SO-2)
- Develop engineering tests for prototype and incorporate findings into final design. (SO-6)
- Show knowledge of current design methods and apply those to engineering design. (SO-4)
- Show how final design can be marketed and utilized in society. (SO-4)
• Show understanding of ethical responsibilities of an engineer in use of final design. (SO-4)
• Collaborate with engineers from other disciplines to develop a detailed design from a concept. (SO-5)
• Present technical information to others. (SO-3)
• Demonstrate skill in computer aided engineering software to produce engineering drawings. (SO-2)

**Student Outcomes**
Graduates of the program will:

• an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

• an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

• an ability to communicate effectively with a range of audiences

• an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and social contexts

• an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

• an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

• an ability to acquire and apply new knowledge as needed, using appropriate learning strategies