

ESE 440: Senior Design I

Fall 2025 Catalog Description:

The senior design sequence (ESE 440 and ESE 441) is a two-semester, team based and independent capstone project with deliverables. The primary objective of the senior design course sequence is to provide a vehicle for students to transition from an academic environment to that of a commercial/ professional engineering environment. Students learn to work in teams to complete a project from concept, practical design based on multiple constraints, to creating a deliverable product meeting the design specifications. Students present written, oral and poster presentations of the project. While most of the project work is done outside the classroom, guest speakers provide insight into other related topics from resume preparation to program management, to team dynamics and to design methodologies used in industry. The project incorporates appropriate engineering standards and multiple realistic constraints. The final grade will be assigned at the end of the two-course sequence ESE 440-441. Not counted as a technical elective. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Credit Hours: 3 credit hours (engineering design).

Course Designation: Required

Text Books: None

Prerequisites: ESE or ECE major, U4 standing; ESE 300; For ESE majors: two ESE electives or for ECE majors: two ECE

Coordinator: Harbans Dhadwal & Gianluigi De Geronimo

Course Learning Outcomes: Upon completing this course, students will achieve the following learning objectives:

1. Proficient in the procedures concerning engineering design.
2. Translate a concept into a deliverable project by the end of the 2nd semester.
3. Proficient in organizational skills for long-term management of time.
4. Develop communication skills for working in a group, deliver oral and written project updates.
5. Develop problem solving skills.
6. Develop methodology for independent learning outside the classroom.

Topics Covered:

This is an independent two-semester capstone project design course which is done entirely outside the classroom, in consultation with a faculty project advisor. During scheduled class meetings, external speakers from a diverse background broaden the design experience for students through their in-person presentations.

Student Outcomes		contribution
1.	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	3
2.	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.	3
3.	an ability to communicate effectively with a range of audiences.	3
4.	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 societal contexts.	3
5.	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.	3
6.	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.	3
7.	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	3

3 - Strongly supported; 2 - Supported; 1-Minimally supported

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