ECE 416: Senior Project Design II

3credits, 3 contact hours. The course is required in COE and EE programs

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Office hours: Thursday 12-2pm or by appointment

TEXTBOOK(S) REQUIRED: None; **PREREQUISITES:** ECE 414.

DESCRIPTION

Continuation and completion of the project based on the proposal approved in ECE 414. Progress of the project is monitored by the instructor with demonstrations and presentations at posted due dates. An oral presentation and demonstration of the completed project by the student team must be given and a written report submitted at the end of the course. Successful projects are approved for the Senior Design Project Showcase where project teams make presentations and demonstrations in front of the audience of students, faculty and industry representatives.

Specific Course Learning Outcomes (CLO): The student will be able to:

1. Work on complex engineering projects; manage teamwork including setting completion schedules, project milestones, and the assignment of responsibilities for each team member.
2. Perform requirements analysis and provide sufficient details in understanding both the functional and non-functional requirements of the system that is to be developed.
3. Produce a written design document that provides sufficient details in understanding how the system is to be developed.
4. Fully understand the ethical issues that arise in the design of the system and the use of the system. Understand societal impact of engineering design.
5. Present and explain details of the designed system at different levels of implementation throughout the course.
6. Continuously perform independent learning of current and new technologies and concepts in order to complete the project.
7. Research, select, learn and utilize the necessary engineering tools and techniques that are needed to complete the project.

Relevant Student Outcomes (ABET criterion 3):

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (CLOs 1, 2, 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 (CLOs 2, 4, 5, 6)
3. an ability to communicate effectively with a range of audiences (CLOs 3, 5)

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (CLOs 3-5)
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 (CLOs 1, 3, 6, 7)
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions (CLOs 1, 2, 3)
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies (CLOs 6, 7).

Academic integrity:

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

COVID-19 and the Senior Design Project

We will follow all safety rules required by the university, including wearing face masks during all indoor activities. Additional rules concerning work in the university lab rooms may be announced.

Grading criteria

1. Project complexity, challenges, and potential impact – 30%
2. Working prototype and performance data – 50%
   Grade is given based on written rubrics.
3. Documentation and presentation (Report: block diagrams, schematics, essential figures, references, appendices) – 20%
   Final report is graded based on written rubrics.

Successful demonstration and presentation of the working device/system will qualify teams for participation in the Senior Design Project Showcase Presentation at the date to be announced.

Late submission of assignment without proper justification is not acceptable. Qualification for the Senior Design Showcase is a condition for receiving A grade.

Facilities

A lab room with the standard benchtop instruments and additional equipment from the stockroom will be available during the course's scheduled time. Open Labs will be available to the project teams. Outside the school, project teams can work at places of their choice. NJIT Makerspace can be a great asset to build project prototypes. Check with the Makerspace about access and training. A limited number of basic laboratory instruments (oscilloscopes, power supplies, and meters) may be offered to the project teams on loan.