

Fall 2023

ECE 416 - ELECT & COMP ENGNR PROJ II

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Department of Electrical and Computer Engineering
New Jersey Institute of Technology

**ECE 416: Electrical and Computer
Engineering Project I
(Senior Project Design II)**

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

INSTRUCTOR: Dr. Marek Sosnowski Office: ECE 200 Tel: 973.596.8464

TEXTBOOK(S) REQUIRED: None

PREREQUISITES: ECE 414.

Catalog Course 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 given due dates of the regularly scheduled course. An oral presentation and demonstration of the 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 presentation at the Senior Design Project Workshop in the presence of students, faculty and industry representatives.

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).

PRELIMINARY SCHEDULE (CHECK MOODLE FOR ASSIGNMETNS DEADLINES)

Week	Activities
1-2	Feedback on the proposals and discussion with the instructor
3	Updated project description and schedule. Describe work on the project accomplished to date. The schedule should list major project milestones and the dates; this is also an opportunity to update the schedule and milestones based on the feedback received on the proposal. The schedule will be used for monitoring the project progress and deviations from the schedule have to be reported. Describe hardware status: what parts and component do you have now and what still have to be obtained? Revised proposals. Only for projects requiring major changes.
4, 6, 8, 10	Project Work Progress Report. Use the provided template.
10	Project Report draft due. Use the provided report template.
11	Qualifying Review for the project showcase; demonstration and oral presentation.
15	Senior Design Project Showcase

Project grading criteria

1. Project complexity, challenges, and achieved objectives – 40%
2. Working prototype and performance data – 40%
3. Documentation (Report: block diagrams, schematics, essential figures, references, appendices) – 20%

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. Penalty of 10% grade points for not delivering assignments on time. Participation in the Showcase is required for A grade.

Honor Code: The NJIT Honor Code will be upheld; any violations will be brought to the immediate attention of the Dean of Students.