ECE 416, Senior Project Design II
3 credits
3 contact hours.
Name of instructor: Xuan Liu

Instructional Materials
PowerPoint notes given during lectures
Reference book: Fundamentals of Engineering Design, 2nd Edition, Barry Hyman, Prentice Hall, 2002, ISBN No. 978-0130467126.

Specific course information

Catalog 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.
Prerequisite: ECE 414

Educational objectives for the course

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).

Brief list of topics to be covered

Revise the proposal with a focus on project timeline
Develop project management framework
Order components
Test individual components
Establish software and hardware environment for development
Development: integration of individual components, testing feasibility, optimization of the design if needed
Prepare for hardware review (prototype demonstration and presentation)
Development: packaging, testing, collecting pilot data
Qualifying Review for the project showcase: demonstration and oral presentation
Development and preparation for final presentation
Senior Design Project Showcase for projects that qualify; final hardware review for projects that do not qualify