

ECE 411: Industry Design Processes

Catalog Description

Prepare students for ECE 412 Senior Project Development I and ECE 413 Senior Project Development II classes. Topics covered include: design documentation standards; building and managing effective teams; product development steps; developing and presenting project proposals; design processes; project scheduling and management; Design to meet desired needs. Class consists of lectures and a small team-based project.

Credit hours: 2

Goals

The objectives of this course are to have students learn standard processes used in engineering industry for requirements gathering, design, development, verification, team management, project management, and communication skills using a hands-on product design experience.

Course Coordinator and Committee

Andrew Greenberg (coordinator)

Martin Siderius

Bob Bass

Doug Hall

Branimir Pejcinovic

Textbooks

R.M. Ford and C.S. Coulston, Design for Electrical and Computer Engineers, McGraw-Hill, 2008, ISBN 978-0-07-338035-3

The course instructor may choose to use a different textbook. Please check with your instructor before purchasing.

Prerequisite

Senior standing in the University. Completion of all junior-level required ECE classes. For non-ECE majors, consent of the instructor.

Learning Outcomes

At the end of this course, students will be able to:

1. Communicate the a design and the rationale for design decisions orally

2. Write and review product design specifications
3. Write and review project proposals
4. Lead a team using modern methods of project management
5. Contribute effectively as a member of a team using modern methods of project management
6. Explain the importance of and integrate principles of DFX
7. Describe and follow steps in the Detailed Design process

Topical Outline

- The Product Development Process
- Needs Identification
- Decision making
- Concept Generation and Evaluation
- System Design Process
- Requirements Specification
- Testing and Documentation
- Schematic Capture and Printed Circuit Board Design

Course Structure and Grading Criteria

Teaching method will primarily be weekly two-hour lectures. The grade will be based on homework assignments, final exam, and a term-length team practicum project (including presentation and demonstration). The grading criteria may vary with instructor. Please refer to the syllabus for your section for details.

Relevant Student Outcomes

- (1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- (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) An ability to communicate effectively with a range of audiences
- (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
- (6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- (7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Prepared by: Andrew Greenberg

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