



Capstone Design I

ECE 3905

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Lab

Course Description:

Fundamentals of the engineering design process. Application of design principles and methodology to conceptual and detailed technical design. Project management during design.

Prerequisites and Co-requisites:

Prereq: Option 1: Prereq or concur: 3080 or Philos 1332, and ECE 2560, 3010, 3020, 3027, 3030, 3040, 3050, and 3090, and Sr standing, and enrollment in Electrical Engineering Program of Study (EES subplan) of the ECE major. Option 2: Prereq or concur: ECE 2050 or 2100, and 3080 or Philos 1332, and ECE 3020, 3027, 3090, 3561, 3567, CSE 2231, and 2451, and Sr standing, and enrollment in Computer Engineering Program of Study (CES subplan).

Course Goals / Objectives:

- Be competent with the principles and issues of engineering design such as problem statements, requirement and objectives analysis, engineering and technical specifications, system models and representation, generation and selection of design concept
 - Demonstrate competence with principles and tools for management of a design project
 - Demonstrate competence in writing technical design and project management documentation
 - Demonstrate competence in a team-based environment
 - Be exposed to the purpose, development, and use of engineering standards
 - Be familiar with the need to consider multiple realistic constraints (e.g. economic, environmental, sustainability, manufacturability, ethical, health and safety, social and political issues) in engineering design
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Course Topics:

- Course introduction, team forming survey and Intellectual Property/ Technology Commercialization Office
 - Formal etiquette, group dynamics, effective professional teams and communications
 - Engineering design methodology and requirements
 - Project management (Gantt charts, task breakdowns, budgets, etc), problem definitions, preliminary design, and critical design.
 - Engineering standards, systems engineering life cycle process
 - Resources for design and implementation of projects, writing center, purchasing and lab safety
 - Report Format, Writing Conventions in Technical Reports, Cover Sheet, Graphs, Illustrations, Equations, Spreadsheets, Tables, Lists, Significant Digits and Uncertainty.
 - Reports in the Workplace, Report Organization, Presentations in the Workplace, Performance During Presentations, Memorandum and E-mail in the Workplace
 - Independent laboratory work
 - Instructor guided lab
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Designation:

Required