The University of Texas at Tyler
Department of Electrical and Computer Engineering

CMPE 4315 Senior Design (Required)

Syllabus

Catalog Description:

The capstone design project builds on previous course work and includes all stages of the design process including project selection, specifications, goals, planning and implementation. The design solution produced takes into account a variety of realistic constraints and engineering standards including public health, safety and welfare, global, cultural, social, environmental, and economic factors. Preparation and presentation of final oral and written reports are required. Projects are defined in cooperation with representatives from industry when possible. Nine hours of Design Studio Lab per week.

Prerequisites: EENG 3308, EENG 4307, CMPE 4309 and CMPE 4342. Pre or Co-requisites: CMST 1311 or CMST 1315

Credits: (0 hours lecture, 3 hours laboratory)

Text(s): None

Additional Material: None

Course Coordinator: Vijayalakshmi Saravanan

Topics Covered: (paragraph of topics separated by semicolons)

This course does not include lectures or presentations of specific topics. The principal interaction between faculty and students is through project design reviews in which faculty meet with individual teams on a periodic basis to discuss design choices and progress toward the project goals.

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Learning Objectives[1]: By the end of this course students will be able to:

1. Write target specifications for a complex engineering project [3].
2. Evaluate alternative design solutions using multiple criteria including public health, safety, and welfare, global, cultural, social, environmental, and economic factors [3].
3. Apply appropriate simulation methods to validate design choices, using modern engineering tools including modeling and simulation software and virtual instruments [3].

4. Create and demonstrate a prototype with more than one interacting sub-system as a solution to the design problem [5]
5. Produce a detailed design solution taking into account final specifications and deliver a professional-quality final design document and/or an oral presentation of the design project [3, 6].
6. Apply relevant professional ethics in the design project and evaluate the impact of the design solutions in global, economic, environmental, and societal contexts [3].
7. Complete the design project by developing a project plan and functioning effectively and meeting objectives as members of a team with a written team contract [8]
8. Devise tests to evaluate and measure the performance of the prototype [3, 5]
9. Utilize engineering literature such as technical manuals and product datasheets to select components to meet experimental or prototype requirements [3]
10. Apply appropriate engineering standards and multiple constraints in the design process [3].
11. Utilize knowledge and skills acquired in earlier course work [3].

[1]*Numbers in brackets refer to method(s) used to evaluate the course objective.*

Relationship to Student Outcomes (only items in dark print apply)[2]: This course supports the following Electrical Engineering Student Outcomes, which state that our students will possess:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics [1, 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 [2, 4].
3. An ability to communicate effectively with a range of audiences [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 [6].
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 [7].
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions [8].
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. [9].

2 *Numbers in brackets refer to Course Learning Objective(s) that address the Program Outcome.*

Criterion 5. Curriculum The curriculum must include: (d) a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work. [10, 11]

Prepared By:	Mukul Shirvaikar	Date:	5 December 2022
Updated By:	Vijayalakshmi Saravanan	Date:	7 January 2026