

EET-2591: COMMUNICATIONS DESIGN PROJECT

Cuyahoga Community College

Viewing: EET-2591 : Communications Design Project

Board of Trustees:

January 2024

Academic Term:

Fall 2024

Subject Code

EET - Electrical/Electronic Engineer

Course Number:

2591

Title:

Communications Design Project

Catalog Description:

Capstone course for the Digital Communications concentration in the Electronic Engineering Technology program. Designed to allow students to demonstrate and apply capabilities and skills acquired during previous engineering technology coursework. Students choose approved communications project compatible with their interest and background or can use a default project. Project includes research, documentation, construction and testing, and concludes with a report and an oral presentation of results.

Credit Hour(s):

2

Lab Hour(s):

4

Requisites

Prerequisite and Corequisite

EET-1180 Surface Mount Soldering and EET-1241 Digital Fundamentals and EET-2220 Electronics II, or concurrent enrollment; and EET-2231 Wired and Wireless Communications, or concurrent enrollment.

Outcomes

Course Outcome(s):

Provide a solution to a problem statement regarding wired, wireless or optic system(s).

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Analyze and explain the feasibility of the project.
2. Estimate the cost of the project.
3. Determine and explain any technical standards that may apply (example, FCC Part 15).
4. Determine and explain any safety standards that may apply (example, UL listing).
5. Determine and explain any environment standards that may apply (example, RoHS - Restriction of Hazardous Substance).

Course Outcome(s):

Design and demonstrate the hardware and/or software solution to the problem statement.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Construct a solution to the problem statement in hardware and/or software.
2. Demonstrate a functional project with test vectors.

Course Outcome(s):

Provide a written project report that follows EET report guidelines.

Essential Learning Outcome Mapping:

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):

1. Demonstrate the use of report writing tools: PowerPoint, Word's drawing tools with equation editor, Visio for case construction, Excel and Multisim circuit simulation software.
2. Include justification for assumptions and identify project/product concerns, for example, multiple part supply sources, single point(s) of failure, write limit to the processor's flash or EEPROM (Electrically Erasable Programmable Read Only Memory), etc.

Course Outcome(s):

Give an oral presentation for the project: technical challenges, software concerns, measured performance, etc.

Essential Learning Outcome Mapping:

Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.

Objective(s):

1. Oral report addressing technical issues to a technical audience.
2. Deliver an oral report addressing market concerns for the project: competition, wholesale and retail cost, etc.

Methods of Evaluation:

1. Tests/Quizzes
2. Homework
3. Written Report
4. Oral Presentation
5. Project

Course Content Outline:

1. Design project
 - a. Objectives and guidelines
 - b. Presentation of design
 - c. Periodic progress meetings
 - d. Grading policy
2. Research guidelines
 - a. Library search
 - b. Internet search
 - c. Proposal of project if different than default project
3. Construction and testing
 - a. Block diagram
 - b. Detailed electrical schematic
 - c. Electronics parts list
 - d. Construction of project
 - e. Testing of project circuitry
 - f. Finalizing project circuit
4. Written project report following guidelines

- a. Abstract
- b. Introduction
- c. Section heading and subheadings
- d. Equations
- e. Tables and figures
- f. Conclusion
- g. References and appendices

5. Oral presentation

- a. Technical issues
- b. Marketing issues

Resources

Molisch, Andreas F. *Wireless Communications: From Fundamentals to Beyond 5G*. 3rd ed. Wiley-IEEE Press, 2022.

Raghunandan, Krishnamurthy. *Introduction to Wireless Communications and Networks: A Practical Perspective*. 1st ed. Springer, 2022.

Sklar, Bernard and Fredric Harris. *Digital Communications: Fundamentals and Applications*. 3rd ed. Pearson, 2021.

Sobot, Robert. *Wireless Communication Electronics by Example*. 2nd ed. Springer, 2022.

Stark, Wayne. *Introduction to Digital Communications*. 1st. ed. Cambridge University Press, 2023.

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