NEW YORK CITY COLLEGE OF TECHNOLOGY

Computer Engineering Technology | Course Outline

Course: CET 4711 - Computer Controlled System Design I
Course coordinator: Prof. F. Zia **Revision Date:** Spring 2020

Credits: 2 **Contact Hrs: 3** **Class Hrs: 1** **Lab Hrs: 0** **Recitation Hrs: 0**
This course is: [X]Required [ ]Elective [ ]Selective Elective

Catalog Course Description:
Modern design principles and methodologies. Software tools for systems design including computer-aided design (CAD) and computer-aided engineering (CAE). Students carry out the conceptual design of a complete device or system.

Pre-Requisites: CET 3510, CET 3625, MAT 2680
Pre- or Co-Requisites: CET 4705

Textbook, title, author and year:
Microcontroller Processing, Third Edition, Steven F. Barrett, 2013, Morgan & Claypool Publishers

ISBN: 9781627052535 paperback, ISBN: 9781627052542 ebook

Other supplemental materials:
AVR Microcontroller and Embedded System, M. Mazidi, Prentice Hall, 2011
ISBN: 978-0-13-800331-9
Arduino Robotics, John-David Warren, Josh Adams, and Harald Molle, Apress, 2011
ISBN: 978-1-4302-3183-7

Course learning outcomes:
Upon successful completion of this course, the student will be able to:
1. Demonstrate basic hands-on knowledge, techniques, and skills in computer-controlled system design
2. Search and retrieve relevant information from online and/or patents databases in support of system analysis and design
3. Understand and analyze interdependence of mechanical, electrical, computer hardware and software subsystems in a computer controlled electro-mechanical system
4. Demonstrate technical expertise in selecting mechanical, electrical, computer hardware and software components and materials to design a computer-controlled system
5. Integrate mechanical, electrical, computer hardware and software subsystems into a working prototype
6. Utilize mathematics and science in support of computer-controlled system design
7. Function as an effective team member
8. Communicate effectively, both orally and in writing
9. Understand the benefits of professional organizations and importance of engineering ethics

General Education Outcomes

KNOWLEDGE/Depth of Knowledge: Engage in an in-depth, focused, and sustained program of study.
SKILLS/Inquiry/Analysis: Use creativity to solve problems.
SKILLS/Inquiry/Analysis: Employ scientific reasoning and logical thinking.

Brief list of topics to be covered:

Week 1-5:
Introduction to computer-controlled system design principles;
Hardware Topics with Hands-on Activities: (Group Activities, Individual Reports)
Micro-controller Hardware, Power Supplies, Alternate Power Sources, IDE Programming Setup, Internal Peripherals and Programming, Output Devices and Programming, Input Sensors and Programming.

Week 6-10:
Introduction to Benefits of Professional Organizations and Importance of Engineering Ethics;
Software Topics with Hands-on Activities: (Group Activities, Individual Reports)
Advanced Programming Techniques, UML Activity Diagrams, UML State Diagrams, Advanced Sensor Programming, Serial Data Communication, I2C Data Communication, Network and Web Communication.

Week 11-15:
Computer Controlled System Design Project: (Group activities, Group Report and Presentation)
Design, Implement, Test and Troubleshoot a Basic Computer Controlled System,
Write a Technical Report,
Make a PowerPoint Presentation.

Student Outcomes listed in the ETAC/ABET Criterion 3 Addressed in this Course	Level
(1) Ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering and technology to solve broadly-defined engineering problems appropriate to the discipline;	R
(2) Ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;	E
(3) Ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;	R
(4) Ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and	E
(5) Ability to function effectively as a member as well as a leader on technical teams.	R

ETAC/ABET Program Criteria: Computer Engineering Technology	Level
a. Ability to analyze, design, and implement hardware and software computer systems.	R
b. Ability to apply project management techniques to computer systems.	
c. Ability to utilize statistics/probability, transform methods, discrete mathematics, or applied differential equations in support of computer systems and networks.	

***Legend**: I (Introduce), R (Reinforce) and E (Emphasize). Unmarked means not addressed*