Course Outcome Summary

Required Program Core Course

ELEC 137 Microprocessors

MONROE COUNTY COMMUNITY COLLEGE

Course Information

Division	Applied Science and Engineering Technology
Contact Hours	90
Total Credits	4.0

Prerequisites   ELEC 135

Course Description

This course is devoted to assembling and programming microprocessor/microcontroller systems with an emphasis on using the 68HC11 microcontroller. Covered are: computer architecture, memory types, interfacing techniques and components, and machine-language programming. Flowcharting, computerized program assembly, and proper hardware and program documentation are emphasized. Lab projects include, but are not limited to, an electronic "playerpiano", programmable timing circuits and an autonomous robot.

This course is a required core course for students pursuing a degree **in**

Electrical Engineering Technology

Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:

A. Acquire and apply technical expertise in the areas of Circuit analysis, Analog electronics, Digital electronics, Microprocessors, and Communication systems.
B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
C. Develop and Demonstrate Problem Solving Skills.
D. Develop a willingness to learn independently.
E. Develop and demonstrate effective wiring and laboratory skills.
F. Demonstrate Equipment/Instrumentation Competence
G. Develop and demonstrate Technical Documentation/Lab Report writing skills and the ability to comprehend Technical Documentation including Schematic Diagrams
H. Demonstrate effective Oral Presentation Skills
I. Value Safety Training, Safe Work Practices and acknowledge Safety Standards
J. Develop and demonstrate the synergistic relationship and integration of various technical and academic fields into the study of Electronics (i.e. Mechatronics)
K. Design, Construct, and Troubleshoot AC and DC Motor Control Circuits and demonstrate an understanding of process control.
L. Demonstrate a thorough understanding of DC and AC theory and operating concepts.

Course Outcomes

1. Identify data types: op code, address, bits, bytes, nibbles, and words and user data, giving examples and subtypes
   Applies to Program Outcome

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2. Identify memory types SRAM, DRAM, ROM, EPROM, EEPROM and addressing modes, giving characteristics of each.
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3. Recognize condition-code flags set by and sensed by specified 68HCII instructions, given the programmer's reference sheet
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4. Idenitfy latches, buffers, decoders, multiplexers, and analog-digital converters
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5. Demonstrate the conversion of any positive number from 0 to 64000 from binary to decimal to hexadecimal representation
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6. Demonstrate addition and subtraction of positive numbers from 0 to 64000 in the binary or hex number systems
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7. Demonstrate the conversion of negative numbers from -1 to -128 to their two'scomplement binary equivalents
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8. Write assembly-language source code for various 68HCII programs, including comments, given a program flow chart and hand asseble into object code
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9. Enter a source program into a host computer, compile it, correct errors, and print machine-assembled object code
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10. Calculate the delay for a program loop, nested loop, or timer-interrupt routine, given the source code and the processor clock speed\
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11. Construct various lab projects that require interfacing techniques
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12. Construct and program an "autonomous" robot to accomplish various tasks
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Updated: 4/4/2019
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