



# Wayne County Community College District

## COURSE SYLLABUS

### MCT 212 ADVANCED ROBOTICS

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**CREDIT HOURS:** 3.00

**CONTACT HOURS:** 60.00

**COURSE DESCRIPTION:**

This is an advanced course in robotic programming for automated material handling. Also include flexible manufacturing, sensors, concept of machine vision, troubleshooting of hardware and software. Emphasis will be on ABB robotics hardware, software and programming.

**PREREQUISITE:** *MCT 202*

**EXPECTED COMPETENCIES:**

Upon successful completion of this course, the student will be able to:

- Define the terms "microcomputer" and "microprocessor".
- Describe the function components of a typical microprocessor.
- Define the data and instruction registers usually found within a microprocessor
- Convert numbers in the binary, octal, or hexadecimal systems to their decimal equivalents and vice versa.
- Add, subtract, multiply, and divide binary, octal, or hexadecimal numbers.
- Perform arithmetic operations using complement systems.
- Distinguish between the various flags used in the status register, their function and Applications.
- Describe how a micro program controls the sequence of events to be executed.
- Define the requirements for double-precision arithmetic.
- List the steps necessary to write a program.
- Discuss the functions of the ALU.
- Explain the control and timing of the microprocessor by use of timing diagrams.
- Describe the interfaces between the microprocessor, ROM or RAM, and the methods of address mapping.
- Describe the operation of all jump instructions and their applications.
- Explain shift and rotate instructions and their applications.
- Describe architecture, configuring, addressing, and programming PIA.
- Explain different types of loops and their applications.
- Show how loops can be combined by nesting.
- Describe subroutine construction and referencing.
- Describe conditional subroutine calls and returns.
- Discuss the use of the stack in initiating and terminating subroutines.
- Show how subroutines can be nested.
- Describe the process of parameter passing by means of registers or memory.
- Explain the function of the I/O instructions for 68HC 11.
- Explain interrupts schemes and discuss the use of interrupts in information exchanges.



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- Analyze the operation of a priority interrupt control unit.
- Describe the function of ports A, B, C, D, and E of 68HC 11.
- Distinguish between fully decoded and linear selection address decoding of device addresses.
- Write programs in machine language and assembly language.
- Convert assembly program to machine program and vice versa.
- Use a simulator to debug a program.
- Perform A/D conversion using 68HC 11.

### **ASSESSMENT METHODS:**

Student performance may be assessed by examination, quizzes, case studies, oral conversation, group discussion, oral presentations. The instructor reserves the option to employ one or more of these assessment methods during the course.

### **GRADING SCALE:**

90%-100% = A

80%-89.9%= B

70%-79.9%= C

60%-69.9%= D

<60% = E