Course Title: Mechatronics I

Course Code & Number: EET-2410

Credit Hour Total: 4
Weekly Contact Lecture Hours: 3
Lab Hours: 2

Prerequisite: EET-2210

Text: Web based text at www.emg.utoledo.edu/~wevans “Hybrid Text”

Course Coordinator: Evans

A. Course Description:

A study of programmable controllers emphasizing program development, logic development and troubleshooting. Emphasis on relays, timers, counters, integer math and scan-dependent programming. Factory floor control concepts are stressed.

B. Related Program Outcomes:

ABET/Student Outcomes

d. Students are encouraged to use creativity in the design and use of programmable logic controller systems and processes.
e. In lab experiments, students are encouraged to function as part of a team.

EET Program Outcomes

None

C. Course Objectives:

In this course students are expected to:

1. Develop an understanding of the programming processes necessary to control a real-time process
2. Develop an understanding of the interaction between hardware and software in a real-time system
3. Work effectively in the laboratory with lab partners
4. Develop an understanding of the processes necessary to organize and complete a programmable controller project
D. Course Outline – Major Content Areas

• Introduction to Relay Logic
• Introduction to PLC programming on the PC
• Introduction to the A-B instruction set
• The Siemens instruction set
• Hardware considerations
• Addressing
• Relay Instructions
• Timer and Counter instructions
• Integer Math
• Comparison Instructions
• Control Panel Construction
• Control Elements exterior to the Control Panel
• Sequential Logic Programming and State Diagrams
• User Specific Instructions

E. Major Laboratory Topics

• Basic Ladder Logic wiring
• Motor Starter wiring
• Introduction to RSLogix
• Introduction to simple combinational logic
• Simple timer and combinational logic to control a traffic intersection
• Simple math and counter operations to control a McDonald’s style cash register
• Full adder logic to add/subtract 16-bit binary integers
• A multiplexer wired and programmed
• More complicated logic – Three pump floating master
• Sequential batching program using indirect addressing