University of Toledo
Electrical Engineering Technology
Master Syllabus

Course Title: Mechatronics II **Course Code & Number:** EET- 4550

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

Prerequisite: EET-2410, Mechatronics I, CSET 2200

Text: Free web-based text at www.eng.utoledo.edu/~wevans under "Hybrid Text"

Software: RSLogix 500 (Allen-Bradley), RSLinx (A-B), RSLogix 5000 (A-B), RSNetworx for DeviceNet (A-B), RSView32 (A-B), PanelBuilder 32 (A-B), Step 7, Step 7 Basic (Siemens)

Course Coordinator: Evans

A. Course Description

Use of programmable controllers and computers in factory automation. Topics include process control, supervisory software, PLC networking, PLC/CNC integration, device configuration, use of programming software and PLC language standards.

B. Related Program Outcomes (d, e):

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

1. Develop an understanding of the programming processes necessary to control advanced real-time processes
2. Develop an understanding of the interaction between hardware and software in a real-time system
3. Work effectively in the laboratory in a team environment

4. Develop an understanding of the processes necessary to organize and complete an advanced programmable controller project

D. Course Outline – Major Content Areas

- Review of A-B, siemen PLC programming
- Addressing Review
- Introduction to programming – RS-Logic Software, Siemens TIA Software
- Introduction to HMI concepts
- Introduction to PLC-CNC programming
- Tuning of Loops, PID Algorithms
- Process Programming
- PLC networking concepts
- Discrete and analog I/O concepts

E. Major Laboratory Topics

- Communication between processors
- Human-Machine-Interface and communication to the PLC
- Message Block communication between controllers (peer-to-peer communication and control)
- PID Block and Control
- ASCII Block communication between PLC and computer
- Fault Recovery Instructions and Procedures
- Stepper and Servo Control
- Device-Net Network
- ControLogix Introduction

WTE 10/18/10