Division: Technical:
Subject code: ELME Course: 208
Course title: Programmable Logic Controllers II

Thaddeus Stevens College of Technology

Master Course Form

Catalog description: This course covers the principles and application of programmable logic controllers (PLC's) featuring the IEC 61131-3 programming standard. Topics include installation of PLC's. How to configure modules. Wiring of input and output modules, including temperature sensing devises. (Thermocouples and resistive temperature detectors) and analog devices featuring 0 – 10 volts and 4 – 20 ma standards. The course also includes programming the built in HMI (Human Machine Interface) which allows program control and status update through a built in touch screen.

Digital Description:

- Credit Hours: 4
- Lecture Hours: 3
- Lab Hours: 3

Prerequisites:

Succesful completion of Programmable logic controllers I ELME 109

Course Objectives:

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

1. Design a project including hardware configuration and communications.
2. Demonstrate how to wire the input and output circuits.
3. Create a ladder logic Program.
4. Develop Displays on a HMI touch screen
5. Program and wire Analog devices.

Learning outcomes:

As a consequence of the classroom and lab experiences, the student should be able to:

- Understanding and demonstration of the Hardware Configurator
- Use the Ladder editor to connect Ladder elements
- Apply Compare, Math, Logic, Clock, Store and Vector functions.
- Insert Function Blocks into programs
- Build program Modules and Subroutines
- Use internal Subroutine jumps and Labels
- Use HNI Editor to create Displays' for your controller Screen.
- Insert variables into a Display
- Show run-time variables as integers
- Represent run-time values with either text, images, or bar graphs.
- Show text messages that vary according to runtime conditions.
- Download and upload projects
- Explain the On-Line test mode (Debug)

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- Use Information Mode
- Configure Analog Inputs and Outputs.
- Understand Analog I/O Ranges
- Configure Digital Inputs and Outputs.
- Use Controller Settings to establish communications with a Personal Computer.
- Interpret CAN bus Network Status.
- Using Utilities.
- Using Project Tools.
- Demonstrate Trouble shooting Skills

Planned Sequence of Learning Activities:

- Creating a project
- Configuring hard ware
- Creating a ladder Logic program
- Create HMI display
- Downloading Program
- Testing Digital I/O
- Add Analog I/O
- Add Temperature sensors
- Start up and trouble shooting

Required Text:
Manuals and documentation are provided via on line access.

Prepared by Art Jackson **Date: 1/20/15**

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