



MASTER COURSE OUTLINE

Prepared By: Bill Autry

Date: October 2014

COURSE TITLE

Programmable Automation Control

GENERAL COURSE INFORMATION

Dept.: IST

Course Num: 152

(Formerly:)

CIP Code: 46.0302

Intent Code: 21

Program Code: 784

Credits: 5

Total Contact Hrs Per Qtr.: 77

Lecture Hrs: 33

Lab Hrs: 44

Other Hrs:

Distribution Designation:

COURSE DESCRIPTION (as it will appear in the catalog)

Programmable Logic Controllers have become the backbone of modern industrial automation. This course explores PLC principles, networking, hardware and operation, with emphasis on ladder logic instruction sets, maintenance and troubleshooting using the Allen-Bradley Compact Logix™ platform and Control Logix™ programming software.

PREREQUISITES

IST 150 or Instructor Permission

TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: *Programming ControlLogix* by Jon Stenerson)

COURSE LEARNING OUTCOMES

Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills.

1. Demonstrate basic computer skills.
2. Describe the functions of hardware and components, i.e. the PLC system.
3. Correlate field devices with the PLC system.
4. Describe how the PLC system relates to other systems—networked devices
5. Interpret ladder logic.
6. The Installation of hardware modules.
7. Performance of minor programming.
8. Troubleshooting PLC hardware system.
9. Troubleshooting software.
10. Preventive maintenance functions

INSTITUTIONAL OUTCOMES

COURSE CONTENT OUTLINE

- 1) Installing/Configuring Hardware
- 2) Understanding the Input/Output section
 - a) I/O section

- b) Discrete I/O modules
- c) Analog I/O modules
- d) Specialty modules
- 3) Processor Units
 - a) Memory types, size, and structure
 - b) Peripherals
- 4) Programming Software
 - a) RS Control Logix™
 - b) RS Linx™
- 5) Memory and project organization
 - a) A-B Control Logix File structure
 - b) Projects
 - c) Tasks
 - d) Programs
 - e) Routines
 - f) Tag addressing
 - g) Arrays
 - h) Structures
- 6) Numbering bases and systems
- 7) Understanding and writing Ladder Logic
- 8) Programming considerations for analog modules
- 9) Programming considerations for specialty modules
- 10) PLC networking
 - a) DF 1 serial communication
 - b) Ethernet/Industrial protocol
 - c) Other networks such as devicenet™ and Controlnet™
- 11) Troubleshooting

DEPARTMENTAL GUIDELINES (*optional*)

Students will be evaluated and grades will be awarded on the following criterion: Attendance; Participation/Assignments; Cumulative quiz and intermediate test scores; and a comprehensive final exam.

DIVISION CHAIR APPROVAL

DATE