MFGT 2560: Manufacturing Automation

A. COURSE DESCRIPTION

Credits: 3
Lecture Hours/Week: 3
Lab Hours/Week: *.
OJT Hours/Week: *.

Prerequisites:
This course requires the following prerequisite:
MFGT 2550 - Programmable Logic Controls

Corequisites: None
MnTC Goals: None

This course provides the learner with an understanding of the knowledge and application skills needed in the area of automation as used in manufacturing. Students learn to recognize and apply sensing methods, actuation methods, and control methods to industrial automation. Emphasis is placed on the most common industrial control methods used in manufacturing. Prerequisite: MFGT2550.

B. COURSE EFFECTIVE DATES: 03/18/1999 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Describe basic automation principles
2. Describe various identification techniques in automation
3. Discuss the role of PLCs in automation
4. Describe industrial network basics
5. Identify industrial network protocol characteristics
6. Discuss automation standards
7. Discuss open and closed loop control
8. Identify stepper and servo motor technology
9. Discuss design and integration concepts in automation

D. LEARNING OUTCOMES (General)

1. The learner will gain an understanding of general industrial control principles. This will include an appreciation of control architecture from stand alone individual machine control to Distributed Control System (DCS) architecture with Supervisory Control and Data Acquisition (SCADA). The learner will be introduced to an array of specialty automation sensors such as Bar Code, Laser Scanning and Visions Systems.

2. The learner will gain an understanding of data communication network models used in industrial control. These will include networks at the device, plant and enterprise level. The focus of this portion of the course is an understanding of network architecture in automation as well as the basics of fieldbus configuration and troubleshooting.

3. The learner will gain an understanding of motor principles as they apply to industrial control. The primary focus will be on basic motor design and understanding of which motor type is appropriate in given applications. Emphasis will be on stepper and servo-motor technology. The learner will understand the basic steps in configuring, controlling and troubleshooting simple servo-motor systems. Applications will be introduced that demonstrate the principles of and differences between open-loop vs. closed loop control.
E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   None

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted