MFGT 2545: Mechatronics II

A. COURSE DESCRIPTION

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

   Prerequisites:
   This course requires the following prerequisite
   MFGT 1560 - Mechatronics I (Number of Years Valid: 5)

   Corequisites: None
   MnTC Goals: None

   This course provides learners with an understanding of the knowledge and application skills needed in the areas of electricity and electronics as used in industry. The course concentrates on the digital principles needed to understand and troubleshoot programmable logic controllers (PLCs) and basic automation electronic equipment. Prerequisite: MFGT1560.

B. COURSE EFFECTIVE DATES: 07/02/2003 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

   1. Recognize mechatronics diagrams.
   2. Describe basic hardware control devices.
   3. Interpret basic control logic.
   4. Discuss basic sensor technology.
   5. Describe power supply fundamentals.
   6. Discuss basic concepts of solid state devices.
   7. Recognize the basics of sinking and sourcing.
   8. Define digital vs. analog characteristics.
   9. Interpret basic Programmable Logic Control logic.

D. LEARNING OUTCOMES (General)

   1. The learner will gain an understanding of the basic mechanical, electrical and electronic components of automated mechatronic systems. This will include knowledge of the various symbols for the components that will make up these basic systems as well as the wiring and logic diagrams that outline the structure and function of the systems. The learner will also be able to explain the various power sources (mechanical and electrical) of mechatronic systems and how they are utilized.

   2. The learner will gain an understanding of the various sensing methods used in mechatronic systems. It will be appreciated how these sensors allow automated control of mechatronic platforms when used as part of the overall automation architecture. A basic introduction to digital electronics will be employed to provide understanding of how these sensors function. The selection and integration of these sensors will be understood at both a physical (electrical) and logical (data flow) level.

   3. The learner will gain an understanding of system level integration of components into mechatronic platforms. This will include an understanding of data flow from sensor, to controller to actuator. The learner will gain an ability to design and author basic mechatronic control programs. The learner will also understand how to combine physical and logical domains to troubleshoot operation and performance of mechatronic systems.
E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   None

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted