MECH 1631: Motors & Drives

A. COURSE DESCRIPTION

Credits: 3
Lecture Hours/Week: 1
Lab Hours/Week: 4
OJT Hours/Week: *.*

Prerequisites:
This course requires the following prerequisite
   MECH 1610 - Basic Industrial Controls
Corequisites: None
MnTC Goals: None

This course adds to student’s knowledge of motors and motor control systems. VFDs will be introduced and applied for control of a three-phase motor. Positioning systems using both stepper and servo drives are explored. Application of industrial equipment is emphasized, and students are required to use and interpret equipment manuals to control and integrate the equipment. Control of DC and single-phase motors are also introduced. (Prerequisite: MECH1610) (3 Credits: 1 lecture/2 lab)

B. COURSE EFFECTIVE DATES: 05/12/2020 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. DC and Single-Phase Motors
2. Three Phase Motors and Drives
3. Stepper Motors and Drives
4. Servo Motors and Drives
D. LEARNING OUTCOMES (General)
   1. Analyze a DC motor system
   2. Set up and operate a DC motor system
   3. Examine a DC generator
   4. Set up and operate a DC generator/Tachometer
   5. Analyze designs of single-phase motors
   6. Explore speeds of single-phase motors
   7. Investigate the operating principals of three phase motors
   8. Explore the components of three phase motors
   9. Explore how the speed of three-phase motor is controlled
  10. Install three phase motor protective devices
  11. Assemble motor systems that control three phase motors
  12. Investigate VFD operation
  13. Program a VFD
  14. Connect devices to a VFD to control a three-phase motor
  15. Troubleshoot a three-phase motor control system
  16. Explore stepper motors
  17. Assemble stepper motor systems
  18. Program stepper motor systems
  19. Troubleshoot a stepper motor control system
  20. Explore stepper motors
  21. Assemble stepper motor systems
  22. Program stepper motor systems
  23. Troubleshoot a stepper motor control system
  24. Explore motor feedback systems
  25. Explore servo drives motors
  26. Assemble servo drives systems
  27. Program servo drives motor systems
  28. Troubleshoot a servo motor control system

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   None

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted