Division: Technical:
Subject code: ELME Course: 117
Course title: Electrical systems II

Thaddeus Stevens College of Technology

Master Course Form

Catalog description: This course covers the principles, application, troubleshooting and maintenance of rotating electrical motors and electronic motor drives as used in industry. Topics include various types of single and three phase motors, various types of DC motors, reduced voltage starting, braking, DC electronic drives and AC variable frequency drives. The course builds upon the principles and applications covered in Electrical systems 1.

Digital Description:

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

Prerequisites:

- Successful Completetion of Electrical Systems I

Course Objectives:

Upon successful completion of the course, the student will be able to describe and demonstrate the following topics.

1. General principles of motor control. Manual starters, Overload relays, Contactors, Motor starters, and Timers.
2. Sensors, switches, and detectors.
3. Basic control circuits, Wiring diagrams, and schematics.
4. Motor control circuits. Hand-Off-Auto controls, Multiple Push-button Stations, Forward- Reverse control, and sequence control.
5. Understanding large scale schematics.

Learning Outcomes:

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

1. General principles of Motor Control.
2. Symbols and Schematic Diagrams
3. Manual Starters
4. Overload relays
5. Relays, Contactors, and Motor starters
6. The Control transformer
7. Timing relays
8. Pressure Switches and Sensors
9. Float Switches
10. Flow switches and Sensors
11. Limit switches
12. Phase failure relays
13. Solenoid and motor operated valves
14. Temperature sensing devices
15. Hall effect sensors

16. Proximity devices
17. Photo detectors
18. Basic control circuits
19. Schematics and wiring diagrams
20. Installing control systems
21. Hand-off auto controls
22. Multiple push button work stations
23. Forward reverse Control
24. Jogging and inching
25. Sequence control
26. DC Motors
27. Solid state DC drives
28. Stepping Motors
29. The motor and starting methods
30. Consequent Pole Motors
31. Magnetic Clutches
32. AC Motors
33. Variable frequency Control
34. Motor installation
35. Developing Control circuits
36. Trouble shooting

Planned Sequence of Learning Activities

- Principles of motor control
- Starters and relays
- Switches and sensors
- Relays
- Control circuits
- DC motors and drives
- Clutches
- AC motors
- Troubleshooting

Required Text: Industrial Motor control ISBN-13: 978-1-133-69180-8

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