

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Motor Controls
COURSE NUMBER	ELET 0253
DIVISION	Career and Technical Education
DEPARTMENT	ELET
CIP CODE	46.0302
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: X Lab: 6
PREREQUISITES	None

COURSE DESCRIPTION

Students will have the opportunity to install manual and magnetic starters and contactors. The photoelectric and proximity controls and controls for agricultural and commercial equipment will be studied.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. The Student will be able to identify workplace safety issues in accordance with OSHA standards.
2. Upon successful completion of this course, the student should be able to identify the job skills necessary to have a successful career in the Electrical Profession.
3. Inspect electrical circuit connections in accordance with the N.E.C. standards of compliance.

TEXTBOOKS

<http://kckccbookstore.com/>

METHOD OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels,

conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Follow manufacturer's instructions and diagrams and install manual and magnetic starters and contactors
- II. Follow manufacturer's instructions and diagrams and install photoelectric controls
- III. Follow manufacturer's instructions and diagrams and install proximity controls
- IV. Install controls for commercial equipment.
- V. Control circuit schematic components
- VI. Magnetic Control
- VII. Overloads, magnetic starters - Two Wire Circuits
- VIII. Pilot Lights
- IX. Multiple Pushbuttons
- X. Selector Switches
- XI. Reversing Controls - Three Phases
- XII. Reversing Controls - Garage Door - Single Phase
- XIII. Three Phase Motors-Way and Delta Configurations
- XIV. Dual Voltage - Three Phase Motors

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Follow manufacturer's instructions and diagrams and install manual and magnetic starters and contactors.
 1. Explain wiring configurations.
 2. Wire control coil.
 3. Determine open and closed contacts.
 4. Explain reverse and forward.
- B. Follow manufacturer's instructions and diagrams and install photoelectric controls.
 5. Explain control voltage.
 6. Test circuit with meter.
- C. Interpret electrical plans for a single-family residence.
 7. Explain control voltage.
 8. Check voltage.
 9. Check closed contacts.
- D. Install controls for commercial equipment.
 10. Explain control voltage.
 11. Check with multi-meter.

- E. Define common abbreviations.
 - 12. Explain N.O.
 - 13. Explain N.C.
 - 14. Explain D.P.D.T.
 - 15. Explain S.P.D.T.
 - 16. Explain T.D.C.
 - 17. Explain T.D.O.

- F. Explain devices and symbols.
 - 18. Define "N.O. Limit Switch".
 - 19. Define "N.C. Limit Switch".
 - 20. Define "N.C. Stop Switch".
 - 21. Define "N.O. Start Switch".
 - 22. Define "Disconnect Switch".
 - 23. Define "Thermal Overload".
 - 24. Define "Magnetic Overload".

- G. Use control circuit schematic components.
 - 25. Install a time delay relay.
 - 26. Install a start push button.
 - 27. Install a stop push button.

- H. Explain magnetic controls.
 - 28. Demonstrate wiring on controls.
 - 29. Point out the power circuit.
 - 30. Point out the control circuit.

- I. Use lighting contactors.
 - 31. Explain purpose.
 - 32. Check control voltage.
 - 33. Check power circuit.

- J. Use overloads, magnetic starters - two wire circuits.
 - 34. Draw the circuit.
 - 35. Determine size of overload.
 - 36. Check control voltage.

- K. Light-up pilot lights.
 - 37. Connect green lamp contact.
 - 38. Connect red lamp contact.

- L. Use multiple push buttons.
 - 39. Draw circuit.

- 40. Control multiple stations.
- 41. Wire multiple stations.

- M. Explain selector switches.
 - 42. Define 3-position.
 - 43. Define 4-position.
 - 44. Define 2-position.

- N. Use reversing controls-three phases.
 - 45. Explain magnetic lock-out.
 - 46. Explain motor reverse operation.

- O. Explain reversing controls on garage door.
 - 47. Define limit switch control.
 - 48. Define single-phase motor.

- P. Use three phase motors-wye and delta configurations.
 - 49. Explain advantages of wye connection.
 - 50. Explain advantages of delta connection.

- Q. Use dual voltage - three phase motors.
 - 51. Explain 480-volt connection.
 - 52. Explain 240-volt connection.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.