

# COURSE SYLLABUS

<b>LAST REVIEW</b>	Fall 2022
<b>COURSE TITLE</b>	Electric Motor Controls
<b>COURSE NUMBER</b>	AMFT 0150
<b>DIVISION</b>	Career and Technical Education
<b>DEPARTMENT</b>	AMFT
<b>CIP CODE</b>	15.0406
<b>CREDIT HOURS</b>	3
<b>CONTACT HOURS/WEEK</b>	Class: X                      Lab: 6
<b>PREREQUISITES</b>	None
<b>COREQUISITES</b>	None
<b>COURSE PLACEMENT</b>	None

## COURSE DESCRIPTION

This class examines the principles and theory of AC and DC electrical motors as well as electrical controls circuitry. Utilizing wiring principles and wiring from Schematic Diagrams to controls operational specification will be covered in this course. Wiring electrical components for control such as switches, relays, contactors, motor starters and variable frequency drives will be utilized to create and troubleshoot Motor Control systems. This class will cover controls components and wiring to disable, enable Motor Control as well as changing speed on variable frequency drives. The students will create useful schematic from specification and test in lab for correct operation.

## 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](https://kansasregents.org/workforce_development/program-alignment)

## Program Learning Outcomes

1. The student will be able to assess hazards, mitigate risk, and develop procedures and protocol to create a safe working environment.
2. Student will be able to collaborate with team members in developing a plan to maximize efficiency in a production facility.
3. The student will be able to evaluate implicit tasks and identify necessary resources to install and maintain industrial equipment.
4. Student will be able to troubleshoot and repair industrial equipment in the high stress environment of modern manufacturing.

## **TEXTBOOKS**

<http://kckccbookstore.com/>

## **METHODS 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. Fundamentals of electrical safety and Lockout – Tagout.
- II. Electrical symbols and Schematic Diagrams for motor control circuits. .
- III. Pictorial diagrams principles of motor control circuits.
- IV. Principles of line voltage and control voltage for safe and functional design.
- V. Relays, contactors and motor starter components used in motor controls
- VI. Holding circuit principles
- VII. Troubleshooting using a multimeter
- VIII. Troubleshooting with Schematic Diagram
- IX. Sizing motor starter overloads according to specification.
- X. Theory of nuisance tripping
- XI. Start. Stop, forward, Reverse and Jog motor starter circuit principles
- XII. Create and implement a working design for timers and counters for motor control circuits.

## **COURSE LEARNING OUTCOMES**

Upon successful completion of this course, the student will:

- A. The student will be able to identify Nema Emergency Stop Industry best practice.
- B. The student will be able to perform Lockout/Tagout procedure.
- C. The student will be able to work with both Schematic and Pictorial Diagrams.
- D. The student will be able to describe Motor Control Wiring Principles.
- E. The student will be able to size motor starter circuit overload protection.
- F. The student will be able to wire labs to specification utilizing switches, relays, contactors, motor starters and other electrical components.
- G. The student will be able to utilize electrical diagrams to build and troubleshoot motor control circuits.
- H. The student will be able to use multimeter to troubleshoot motor control circuits and test components.

## **ASSESSMENT OF COURSE LEARNING OUTCOMES**

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>.