Course Information Form (CIF)

Course Code: ELT 134

Course Title: Motors, Controls, and Drives

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 47.0105
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 2-2-3
Credit Hour Distribution:

Lecture: 2	Lab: 2	Clinical: 0	**Total: 3**

General Course Information

Catalog Description

Learn about electrical symbols, ladder and wiring diagrams, motors and motor control circuits, including DC, single- and three-phase, electromagnetic, and DC and AC electronic controllers. Emphasis on control, wiring, and troubleshooting of motors and control circuits.

General Course Objectives

Identify electrical symbols and connect and test motor control circuits from ladder and wiring diagrams. Identify and describe the operation of common DC and AC motors and control circuits.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in ELT 150 with a grade of C or higher

Methods of Evaluation

Minimum of 6 quizzes, mid-term exam, final exam. Minimum of 10 labs. In-class and/or homework assignments recommended.

Instructional Materials and Additional Supplies

Troubleshooting Electric Motors, 5th Edition. Mazur. ISBN# 9780826918161
Safety Glasses

Course Content

General Learning Outcomes (GLOs)

- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Course Introduction, Electrical Tools and Test Equipment, Electrical Safety	1. Identify tools and the equipment used in the lab and demonstrate the proper and safe use of said equipment. 2. Identify safety equipment in the lab and describe and practice proper procedures for working with industrial machinery and electricity. 3. Identify and describe OSHA safety color codes, define hazardous locations, and describe safe working practices.	2	0	0
Electrical Symbols and Diagrams	1. Identify electrical symbols and describe the operation of the components they represent. 2. Construct a start/stop motor control circuit.	2	0	0
Solenoids	1. Describe the basic operation of DC and AC solenoids. 2. Identify components and terminal connections of DC and AC solenoids. 3. Demonstrate the ability to connect and test a solenoid.	1	1	0
Transformers	1. Describe the operation of transformers. 2. Identify components and terminal connections of transformers. 3. Demonstrate the ability to connect and test a transformer.	1	1	0
Contactors and Motor Starters	1. Describe the operation of contactors and motor starters. 2. Identify components and terminal connections of contactors and starters. 3. Demonstrate the ability to connect and test motor starters and their associated control circuits.	2	2	0
Single-Phase Motors	1. Describe the types and characteristics of single-phase AC motors. 2. Identify components and terminal connections of single-phase AC motors. 3. Demonstrate the ability to connect and test a single-phase AC motor using a ladder diagram.	2	2	0
Direct Current Motors	1. Describe the types and characteristics of DC motors. 2. Identify components and terminal connections of DC motors. 3. Demonstrate the ability to connect and test a DC motor using a ladder diagram.	2	2	0
Three-Phase Motors and Three-Phase Power Circuits	1. Describe the types and characteristics of 3-phase AC motors. 2. Identify components and terminal connections of 3-phase AC motors. 3. Demonstrate the ability to connect and test a 3-phase motor control circuit using a ladder diagram.	2	2	0
Reversing Motor Control Circuits	1. Identify and describe common reversing circuits for DC and AC motors. 2. Connect and test a reversing control circuit using ladder and wiring diagrams.	2	2	0
Nameplate Data and Motor Selection	1. Define motor nameplate specifications and determine motor selection based on application characteristics.	2	0	0
Motor Protection and Motor Failure	1. Calculate overload selection based on nameplate data and application, and identify common motor failure causes.	2	2	0
HVAC Control and Motors	1. Describe residential HVAC controls, motors, start-up sequences for furnaces, and air conditioner controls. Troubleshoot and repair.	4	6	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Electronic DC Motor Controllers	1. Describe electronic DC motor controller operation and applications. 2. Connect and test electronic DC motor controllers and DC motors.	2	2	0
Electronic AC Motor Controllers	1. Describe electronic AC motor controller operation and applications. 2. Demonstrate the ability to connect and test VFDs (variable frequency drives) to a 3-phase AC motor and adjust the operating parameters based on written instructions.	4	8	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0