

Department:

Electrical Technology

Course Description:

This course is a continuation of ELE162 Electrical Motor Operations & Control. Its purpose is to provide an understanding of reversing motor circuits, solid state devices and system integration, timing and counting functions, relays and solid state starters, sensing devices and controls. Students connect numerous types of control sequences in the shop, along with diagramming and troubleshooting equipment. The current National Electrical Code (NEC) will be used in this course.

Course Competencies:

Upon completion of the course, the student should be able to:

1. Able to wire forward reversing start with interlocks.
2. Identify parts of a motor to its leads.
3. Identify types of three-phase motors.
4. Identify types of single-phase motors.
5. Demonstrate with a multimeter the effects of forward and reverse biasing.
6. Describe photoelectric sensors; and inductive and capacitive proximity sensors.
7. Demonstrate troubleshooting a three phase motor reversing circuit.
8. Demonstrate the ability to connect, program, and operate ON/OFF delay relay.
9. Demonstrate the ability to troubleshoot timers and relays.
10. Demonstrate ability to connect and operate counters.
11. Demonstrate the ability to connect, operate, and troubleshoot sensors and pilot devices.
12. Design, connect, operate, and troubleshoot a timed one-shot and a timed repeat cycle motor control circuit.

Course Content:

- A. Reversing Motors
- B. Solid state Devices
- C. Timing Functions
- D. Relays and starters
- E. Sensing controls
- F. Programmable controllers
- G. Reduced voltage starters
- H. Accelerating and decelerating methods
- I. Preventive maintenance systems

Learning Assessments:

The student will take a test after each chapter and at the end of the course.

TESTS: Tests will cover one to two chapters. Test questions may be multiple choice, essay, or fill in the blank. You will be allowed to make up a test that was missed or failed, with the condition

that it needs to be done in the week it was missed. Failed tests that are retaken will be averaged with the first test for your final score.

QUIZZES: The instructor may give unannounced and announced quizzes during the semester. These quizzes will be over either subject matter assigned or subject matter previously discussed. Students may not make up quizzes.

Instructional Materials:

Textbook: Rockis, G.J., & Mazur, G.A. (2014). *Electrical Motor Controls* (5th ed.). Orland Park, IL: American Technical Publishers. ISBN-13: 978-0826912268

Rockis, G.J., & Mazur, G.A. (2014). *Electrical Motor Controls for Integrated Systems: Workbook* (5th ed.). Orland Park, IL: American Technical Publishers. ISBN-13: 978-0826912275

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).