

**Department:**

Transportation Division; Diesel Technology Program

**Course Description:**

This course of basic electrical systems on the diesel engine teaches troubleshooting and component testing using digital multimeters.

**Course Competencies:**

The learning outcomes and competencies detailed in this syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups for this course as approved by the Kansas Board of Regents.

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

1. Apply Ohm's Law
2. Identify general electrical systems components
3. Analyze basic electrical systems
4. Interpret electrical schematics and circuits
5. Identify battery construction and operating principles
6. Identify starting systems components
7. Analyze starting systems components
8. Repair starting systems
9. Identify charging systems components
10. Analyze charging systems
11. Repair charging systems
12. Inspect lighting systems
13. Repair lighting systems
14. Identify electronic components
15. Identify fault warnings
16. Demonstrate proper use of electrical/electronic service tools
17. Identify data link systems

**Course Content:**

- A. Basics of Electricity
  - 1) Principles of Electricity
    - a) Conventional Versus Electron Theory
- B. Electronic Engine Controls and Fuel Injection
  - 1) Diesel Engine Control Systems
  - 2) Electronic Control Module
    - a) Voltage Signals
- C. Diesel engine Charging Systems
  - 1) Charging System
    - a) Principles of Magnetism

- 2) Alternators
- D. Diesel Starting Systems Emergency jump-start a vehicle
  - 1) Starting System
  - 2) Electric Starter System Components
    - a) Starter Motor Design and Operation

## Learning Assessments:

Competencies will be assessed by assignments, case problems, quizzes, chapter tests, hands-on projects, lab assignments, a midterm test, and a final test. The test can be in the objective format or in a problem solving format.

## Instructional Materials:

Textbook: Mack, James P., Daniels, Jason A., DeHart, Mark A., and Norman, A. (2022). *Diesel Engine Technology* (9<sup>th</sup> ed.). Tinley Park, IL: The Goodheart-Willcox Company, Inc. ISBN-13: 978-1-64564-685-3

Workbook: Mack, James P., Daniels, Jason A., DeHart, Mark A., and Norman, A. (2022). *Diesel Engine Technology* (9<sup>th</sup> ed.). Tinley Park, IL: The Goodheart-Willcox Company, Inc. ISBN-13: 978-1-64564-686-0

### 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](#).