

**Department:**

Diesel Technology

**Course Description:**

Students will become proficient in the diagnosis and repair of electrical circuits including testing, repairing, and/or replacing of components.

**Course Competencies:**

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

1. Raise and support a vehicle safely.
2. Tilt a cab properly.
3. Properly use a fire extinguisher.
4. Identify safety issues in the shop.
5. Identify the parts of a battery and work safely around them.
6. Use Ohm's law to calculate electrical properties.
7. Read, interpret, and diagnose electrical/electronic circuits using wiring diagrams.
8. Check continuity in electrical/electronic circuits using appropriate test equipment.
9. Obtain amperage, voltage, and resistance measurements.
10. Find shorts, grounds, and opens in electrical/electronic circuits.
11. Inspect, test, and replace fusible links, circuit breakers, and fuses.
12. Inspect, test and replace spike suppression diodes/resistors and capacitors.
13. Inspect, test, and replace relays and solenoids.
14. Perform repairs to copper wires using solderless connections.
15. Solder splices to copper wire.

**Course Content:**

- A. Fundamentals of Electricity
  1. Atomic Structure and Electron Movement
  2. Conductors and Insulators
  3. Current Flow
  4. Magnetism
- B. Batteries
  1. Battery-operating principles
  2. Battery Ratings
  3. Battery maintenance
  4. Battery Testing
- C. Charging Systems
  1. Alternator Construction
  2. Alternator Operation
  3. Charging System Failures and Testing
- D. Cranking Systems
  1. Cranking Circuit Components
  2. Starter Rebuild

3. Cranking Circuit Testing
- E. Chassis Electrical Circuits
  1. Lighting systems
  2. Auxiliary Electrical Equipment
  3. Rapid Checking of a truck Electrical Circuit

## 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: Bennett, S. (2019). *Heavy Duty Truck Systems* (7<sup>th</sup> ed.). Cengage Learning. ISBN-13: 978-1337787109

Bennett, S. (2019). *Heavy Duty Truck Systems Student Workbook* (7<sup>th</sup> ed.). Cengage Learning. ISBN-13: 978-1337787116

### 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](#).