



## HEAVY DUTY ELECTRICAL — HCEM 1132

### A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 2.00
- **Lab Hours/Week:** 1.00
- **OJT Hours/Week:** 0
- **Prerequisites:** None
- **Corequisites:** None
- **MnTC Goals:** None

This is an introduction to electricity as applied to heavy equipment covering electronic theory and magnetism. Emphasis is on theory, diagnosis and repair of basic starting, charging, lighting and ignition systems. This course prepares students for Heavy Duty Electronics HCEM1234 through classroom instruction and lab practice.  
Prerequisites: None.

### B. Course Effective Dates: 8/21/03 – Present

### C. Outline of Major Content Areas

As noted on course syllabus

### D. Learning Outcomes

1. apply Ohm's Law to a parallel circuit
2. apply Ohm's Law to a series circuit
3. apply Ohm's Law to a series-parallel circuit
4. demonstrate shop safety
5. demonstrate use of specialized equipment
6. describe basic steps of troubleshooting electrical systems
7. explain electro magnetism
8. explain functions and types of charging circuits
9. explain fundamentals of magnetism
10. explain operations of the starting motors
11. explain theory of direct current (DC) electricity
12. identify wire gauge size
13. repair alternator and regulator failures
14. replace terminals and connectors

15. troubleshoot starting circuits

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

**F. Learner Outcomes Assessment**

As noted on course syllabus

**G. Special Information**

None noted