# Electronics & Electrical Systems I Course No. 40200 Credit: 1.0

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| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Mobile Equipment Maintenance (47.9999) - Technology Strand II

Course Description: A comprehensive, **technical level** course designed to provide students with the basic theories, equipment, and skills needed to inspect and service electrical systems.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Diagnose and Repair battery starting and charging systems

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Clean and inspect battery clamps, cables, and connectors. |  |
| 1.2 | Perform battery condition tests. |  |
| 1.3 | Jump-start a vehicle. |  |
| 1.4 | Charge and install a battery. |  |
| 1.5 | Diagnose starting system problems and determine necessary action. |  |
| 1.6 | Diagnose starting system problems and determine necessary action. |  |
| 1.7 | Remove, clean, and inspect starter motor and components; reinstall. |  |
| 1.8 | Apply knowledge and understanding of a parasitic drain test. |  |
| 1.9 | Diagnose charging systems and repair or replace components if necessary. |  |
| 1.10 | Remove, clean, inspect ,and reinstall generator (alternator). |  |
| 1.11 | Maintain and restore electronic memory functions; identify and perform required reinitialization or code entry after a battery voltage loss. |  |

## Benchmark 2: Electrical Circuits

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Apply knowledge and understanding of basic electrical theories to construct and analyze all types of basic electrical circuits. |  |
| 2.2 | Utilize electrical system schematics and symbols to locate and identify components and analyze and repair electrical circuits. |  |
| 2.3 | Compute unknown voltages, amperage, and resistances in basic circuit types using Ohms Law. |  |
| 2.4 | Check continuity in electrical circuits using a test light, DVOM. |  |
| 2.5 | Check for shorts, opens, and grounds. |  |
| 2.6 | Measure resistance in electrical circuits using an ohmmeter. |  |
| 2.7 | Measure voltage with a voltage meter. |  |
| 2.8 | Measure current with an ammeter and amp probe. |  |
| 2.9 | Diagnose and repair wires, terminals, and wiring harnesses. |  |
| 2.10 | Use voltage drop test to determine electrical circuit condition. |  |
| 2.11 | Explore module networking communications. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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