# Diesel & Heavy Equipment Technology I Course No. 40218 Credit: 1.0

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

Pathways and CIP Codes: **Vehicle Maintenance and Repair (47.0600)**

Course Description: A comprehensive, **technical level** course designed to provide students with basic theories and information needed to develop an understanding of heavy equipment, to include over the road trucks, mining/construction and agriculture equipment.

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:  Shop Operations and Safety

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Identify sources of service information |  |
| 1.2 | Identify and demonstrate safe shop practices |  |
| 1.3 | Operate tools and equipment safely |  |
| 1.4 | Understand and demonstrate lifting, blocking and bracing techniques |  |
| 1.5 | Identification and proper use of fuels, lubricants and solvents |  |
| 1.6 | Identify common fasteners and usage |  |

## Benchmark 2: Diesel Engine

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Demonstrate knowledge of diesel engine fundamentals |  |
| 2.2 | Demonstrate knowledge of diesel engine service procedures |  |
| 2.3 | Demonstrate proper preventive maintenance of diesel engines |  |
| 2.4 | Identify and explain fuel delivery systems |  |
| 2.5 | Identify and explain exhaust and emissions systems |  |

## Benchmark 3: Hydraulic, Pneumatic, and HVAC

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Understand Pascals Law and Fluid Properties |  |
| 3.2 | Identify components in a fluid power/pneumatic circuit |  |
| 3.3 | Identify basic hydraulic and pneumatic symbols. |  |
| 3.4 | Read and understand Schematic Diagrams. |  |
| 3.5 | Demonstrate knowledge of HVAC fundamentals |  |
| 3.6 | Identify and visually inspect HVAC components |  |

## Benchmark 4:   electrical

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Understand Ohms Law and Electrical Theory |  |
| 4.2 | Demonstrate Knowledge of Basic Electrical Circuits |  |
| 4.3 | Identify components of electrical schematics |  |
| 4.4 | Perform battery maintenance and testing |  |
| 4.5 | Basic diagnostics using a multimeter or other test equipment |  |

## Benchmark 5: Drivetrain

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Explain transmitting power fundamentals |  |
| 5.2 | Explain variations of transmission types and systems |  |
| 5.3 | identify and explain axles, final drives and driveline components |  |
| 5.4 | Perform inspection of fluid in transmissions, axles, and final drives |  |

## Benchmark 6: Brakes

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Demonstrate knowledge of brake principles |  |
| 6.2 | Demonstrate knowledge of brake components (Air and Hydraulic) |  |
| 6.3 | Inspect hoses, fittings, and lines for damage |  |
| 6.4 | inspect brake pads and shoes for wear, thickness and adjustment |  |
| 6.5 | Inspect rotor, drums and related components |  |

## Benchmark 7: Suspension & Steering

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 7.1 | Demonstrate knowledge of suspension and steering components |  |
| 7.2 | Identify various styles of suspension and steering systems |  |
| 7.3 | Inspect tires for wear, deformations and proper inflation |  |
| 7.4 | Inspect and service suspension and steering components |  |

## Benchmark 8:  Welding, Cutting & heating

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 8.1 | Identify oxyacetylene cutting and brazing equipment |  |
| 8.2 | Demonstrate oxyacetylene cutting techniques |  |
| 8.3 | Explain the physical processes of arc welding |  |
| 8.4 | Demonstrate ARC welding in Flat position |  |

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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