# Alternative Power Course No. 40210 Credit: 0.5

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

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

Course Description: A **technical level** course designed to provide students with basic theories and information needed to develop an understanding of alternative power used in vehicles.

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 and retrieve sources of service information. |  |
| 1.2 | Identify and demonstrate safe shop procedures, including safe operation of tools. |  |
| 1.3 | Demonstrate knowledge of chemical safety, including proper handling and disposal of hazardous materials. |  |
| 1.4 | Demonstrate proper use of PPE (Personal Protective Equipment). |  |

## Benchmark 2: Hybrid Technology

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Recognize various hybrid technologies. |  |
| 2.2 | Discuss principles of power flow in hybrid transmissions. |  |
| 2.3 | Discuss principles of regenerative braking. |  |
| 2.4 | Compare impact on vehicle emissions from hybrid technologies. |  |

## Benchmark 3: Flexible Fuel Vehicles

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Describe/Explain FFV principles of flexible fuel production. |  |

## Benchmark 4: Electric Vehicles

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Explain principles of energy production (fossil fuel, solar, hydro, wind, and nuclear) and power storage. |  |
| 4.2 | Describe/Explain electrical motor principles. |  |
| 4.3 | Describe/Explain production and characteristics of batteries used in electric vehicles. |  |

## Benchmark 5: Hydrogen and Fuel Cell Vehicles

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Describe/Explain principles of production, distribution and storage of hydrogen.  |  |
| 5.2 | Describe/Explain fuel cell technology. |  |
| 5.3 | Describe/Explain usage of hydrogen in internal combustion. |  |

## Benchmark 6: Emerging Trends

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Research and report on future and emerging trends in alternative and green power. |  |

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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