# Wind Energy Operations Course No. 41160 Credit: 1.0

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

Pathways and CIP Codes:Energy (17.2071)

Course Description: A **technical level** course in which students will learn many facets of the rapidly growing wind energy industry, to include topics such as mechanical, electrical, safety, and historical aspects of wind energy.

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: Fundamentals of Wind energy

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Discuss the history of harnessing wind energy and its future. |  |
| 1.2 | Define and explain wind energy specific terms including different classifications of wind turbines. |  |
| 1.3 | Explain the function of the wind turbine foundation, tower, nacelle, and rotor assembly. |  |
| 1.4 | Discuss the history of the design of wind turbine blades. |  |

## Benchmark 2: Science of Wind turbines

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Explain how wind speed, rotor swept area, and air density are used to calculate potential wind energy. |  |
| 2.2 | Describe the performance of wind turbine blades as it relates to their airfoil, lift, drag, pitch, and yaw. |  |
| 2.3 | Explain how wind energy is used to produce electric energy and what are its advantages and disadvantages. |  |

## Benchmark 3: safety in the wind energy industry

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Explain mechanical, electrical, hydraulic, climbing, and severe weather safety issues in the wind industry. |  |
| 3.2 | Explain the importance of OSHA and the regulations related to the wind industry. |  |
| 3.3 | Explain proper use and inspection of personal protective equipment (PPE) including: safety glasses, hearing protection, work gloves, arc rated gloves, steel or composite boots, and head protection. |  |

## Benchmark 4: Wind Farm Operations and Maintenance

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Identify different types of mechanical fasteners and torquing and tensioning requirements, tools, techniques, and safety considerations. |  |
| 4.2 | Explain how anemometers, other sensors, SCADA, and computer networks are used to monitor and control wind farm operations. |  |

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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