# Energy Industry Fundamentals Course No. 41105 Credit: 1.0

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

Pathways and CIP Codes:Energy (17.2071)

Course Description: This **technical level** course is an important part that shows how energy is vital to society and how all of it is connected throughout our grid system. It also will show how energy plays a pivotal role in our economic system and drives legislation in public policy. This course is aligned and can lead to a nationally recognized industry credential through the Center for Energy Workforce Development. These competencies are an overview and offered as a basic understanding of essential concepts to be covered.This course required for pathway approval.

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: Power of energy

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Evaluate the importance of efficiency and improvement strategies for the overall energy ecosystem. (generation/transmission/end use) |  |
| 1.2 | List the primary generation sources of grid electricity, the advantages, limitations, historical changes of each. |  |
| 1.3 | Identify/diagram the main equipment installed in a U.S. electrical grid and associated interactions, from source to load. |  |
| 1.4 | Define core terminology used in the energy industry connecting these terms with real-world examples. |  |
| 1.5 | Discuss the significance of energy to individuals, businesses, and communities. |  |

## Benchmark 2: The evolution of energy

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Construct a timeline illustrating milestones in the history of national energy production/uses and describe importance/impacts of the milestones. |  |
| 2.2 | Classify and differentiate between the primary types of electric utilities in the U.S. by how they generate revenue and compare revenue streams. |  |
| 2.3 | Explain energy regulatory agencies, utility deregulation, and evaluate the impacts on the energy companies and markets. |  |
| 2.4 | Describe the carbon cycle, why its balance is essential, and factors which drive energy companies to innovate, evolve and decarbonize. |  |

## Benchmark 3: Our Interconnected Grid

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Identify and describe the main components of electric transmission system, including substation components. |  |
| 3.2 | Explain preventative, reactive, and condition-based maintenance and common tools of the trade. |  |
| 3.3 | Explain where natural gas comes from, its creation, and the important role it plays in maintaining a reliable power grid. |  |
| 3.4 | Categorize the different aspects and challenges of electrification within the energy ecosystem. |  |
| 3.5 | Describe why the national grid needs to modernize, define risks to our energy infrastructure, and ways to improve grid reliability. |  |
| 3.6 | Identify benefits of smart grids. |  |

## Benchmark 4: Human impact on the environment

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Identify and explain categories of charges on utility bills and factors influencing use of energy. |  |
| 4.2 | Define distributed generation and describe net metering. |  |
| 4.3 | Describe the purpose of demand-side management and give examples of practical applications. |  |
| 4.4 | Identify specific federal and state public policies that impact the energy industry. |  |
| 4.5 | Describe methods for attaining more equitable energy generation and use (Energy justice.) |  |
| 4.6 | Evaluate various energy industry careers and their associated requirements/pathways. |  |

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

Instructor Signature:

For more information, contact:

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