# 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 opportunity to directly link to a nationally recognized industry credential. Links to further information and an instructor guide can be found at these locations: http://www.cewd.org/index.php - The Center for Energy Workforce Development (source of this work)http://www.cewd.org/curriculum/about-the-eifcertificate.php - Information about the EIF Certificate, the curriculum, and the instructor’s guide. The course also leads to an industry recognized badge. **These competencies are an overview and are not intended to supplant the Instructor’s Guide. They are offered as a basic understanding of essential concepts to be covered.** 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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