# Energy Industry Fundamentals Course No. 41105 Credit: 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| **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:

CTE Pathways Help Desk

(785) 296-4908

pathwayshelpdesk@ksde.org



900 S.W. Jackson Street, Suite 102

Topeka, Kansas 66612-1212

[https://www.ksde.org](https://www.ksde.org/)

The Kansas State Department of Education does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities and provides equal access to any group officially affiliated with the Boy Scouts of America and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: KSDE General Counsel, Office of General Counsel, KSDE, Landon State Office Building, 900 S.W. Jackson, Suite 102, Topeka, KS 66612, (785) 296-3201.