# Introduction to Energy Course No. 41100 Credit: 0.5

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

Pathways and CIP Codes:Energy (17.2071)

Course Description: An **Introductory course** designed to teach students about the occupations in the Energy field and the skills required for those occupations. 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: Energy basics

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Understand the concepts of energy: |  |
|  | * eight forms of energy & how energy can perform work |  |
|  | * differentiate between potential energy and kinetic energy |  |
|  | * how energy can be transformed. |  |
| 1.2 | Understand how humans utilize energy: |  |
|  | * what types of energy is used by humans |  |
|  | * how humans have historically used energy |  |
|  | * how energy use has changed over time specifically with industrial revolution. |  |
|  | * how new forms of renewable and alternative energy sources may be used in the future. |  |
| 1.3 | Demonstrate an ability to understand and interpret data as it relates to energy : |  |
|  | * read graphs and charts to analyze data and to communicate information about energy |  |
|  | * how data can be used to understand and create opportunities around energy |  |
|  | * how computers, data, analytics, and machine learning can be used to optimize energy generation and consumption in the United States. |  |
| 1.4 | Understand what careers are available in the energy field. |  |

## Benchmark 2: Energy theory and application

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Understand how energy is generated and distributed: |  |
|  | * types of power generation |  |
|  | * electrical power distribution lines |  |
|  | * natural gas, water and sewer distribution |  |
|  | * how energy is metered, including smart meters, and billed. |  |
| 2.2 | Understand how energy is used in a building: |  |
|  | * Building envelope |  |
|  | * Lighting systems |  |
|  | * Heating, cooling, and ventilation |  |
|  | * Water consumption |  |
|  | * Other. |  |
| 2.3 | Perform an energy audit in a building: |  |
|  | * Conduct energy use benchmarking using historical energy consumption |  |
|  | * Identify equipment, systems and processes that use energy in a building |  |
|  | * Identify the factors that impact energy use in a building. |  |
| 2.4 | Identify opportunities to optimize energy use in a building: |  |
|  | * utilize building data to identify opportunities for energy optimization |  |
|  | * calculate the cost and other impacts of optimized energy use. |  |
| 2.5 | Present findings and recommendations from energy audit: |  |
|  | * create visual aids |  |
|  | * Oral presentation to school district personnel and/or community members. |  |

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](mailto: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.