# Introduction to Environmental Science Course No. 41207 Credit: 0.5

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

Pathways and CIP Codes:Energy (17.2071)

Course Description: An **introductory level** course designed to instruct students about the concepts of our environment.

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: Foundations of Environmental Science

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Investigate environmental problems facing the world (i.e., Overpopulation, pollution, resource depletion). |  |
| 1.2 | Demonstrate a knowledge of the components of an ecosystem. |  |
| 1.3 | Explain the relationship between energy and nutrients (e.g. energy flow, nutrient cycling, Carbon/Oxygen Cycle, Nitrogen Cycle). |  |
| 1.4 | Comprehend population dynamics (e.g., population size (N), population density, population growth, carrying capacity, biotic potential, environmental resistance (abiotic and biotic). |  |

## Benchmark 2: Water in the Environment

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Outline the water treatment process (waste disposal, waste usage, and drinking treatments). |  |
| 2.2 | Perform water testing activities (e.g., hardness, turbidity, coliform, pH, minerals). |  |
| 2.3 | Discuss EPA water quality standards and the rationale. |  |
| 2.4 | Explain basic water chemistry. |  |
| 2.5 | Identify sources and uses of water in Eastern and Western Kansas. |  |
| 2.6 | Diagram the water cycle. |  |
| 2.7 | Recognize water pollution, including major types of pollutants (pathogens, inorganic chemicals, organic chemicals, radioactive materials) and pollutants that cause ecosystem disruption (sediments, plant nutrients, oxygen demanding wastes, thermal). |  |

## Benchmark 3: Air in the Environment

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Explain the parts of the atmosphere and importance of Troposphere. |  |
| 3.2 | Describe the effects of major air pollutants. |  |
| 3.3 | Explain the causes of stratospheric ozone depletion (e.g., UV radiation, CFC’s, Montreal Protocol). |  |
| 3.4 | Summarize the Greenhouse effect and global climate change. |  |
| 3.5 | Explain the mitigation strategies that reduce or eliminate major air pollutants. |  |

## Benchmark 4: Human Impact on the Environment

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Predict the environmental consequences of population change for a country (e.g. food demand and environmental impact, energy demand and environmental impact). |  |
| 4.2 | Understand the concepts of ecological foot print and full life cycle analysis when analyzing human impact on the environment. |  |

## Benchmark 5: Energy and the Environment

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Identify local energy resources compared to State, National, and world resources. |  |
| 5.2 | Explain forms of energy consumption. |  |
| 5.3 | Define energy reserves (e.g., proven vs. Potential, technologically and economically feasible, conventional and nonconventional). |  |
| 5.4 | Describe pollution caused by searches for energy (i.e., strip mining, deep mining, mountaintop removal/valley fills, habitat destruction). |  |
| 5.5 | Predict the impact of future sources of energy on the environment (e.g., Geoengineering, Alternatives: nuclear, hydropower, solar, wind, hydrogen fuel cells, bio-fuels, thermal conversion, anaerobic digester “cow power”). |  |

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

Instructor Signature:

For more information, contact:

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