# Meteorology Course No. 03006 Credit: 1.0

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

Pathways and CIP Codes: Energy (17.2071)

Course Description: **Technical Level:** Meteorology courses examine the properties of the earth’s atmosphere. Topics usually include atmospheric layering, changing pressures, winds, water vapor, air masses, fronts, temperature changes and weather forecasting.

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: General Knowledge

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Define the role of meteorology as an academic discipline and identify potential career opportunities. |  |
| 1.2 | Explain how the Earth constitutes a single interconnected system of systems. |  |
| 1.3 | Summarize methods of interpreting and using current environmental data from local and remote sources. |  |
| 1.4 | Summarize the basic laws of physics and thermodynamics. |  |

## Benchmark 2: Atmosphere

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Describe what an atmosphere is and why it is important. |  |
| 2.2 | Describe and explain the origin, composition, structure, short-term and long-term behaviors of the earth’s atmosphere. |  |
| 2.3 | Compare and contrast the Earth’s atmosphere with the atmosphere of other planets in our solar system. |  |
| 2.4 | Demonstrate how to take air temperatures. |  |
| 2.5 | Examine forms of condensation. |  |
| 2.6 | Explain the connection between dew point and relative humidity. |  |
| 2.7 | Measure wind chill factor. |  |
| 2.8 | Relate air masses to weather fronts. |  |
| 2.9 | Identify the different types of storms and associated weather. |  |
| 2.10 | Explain the composition of the Earth’s atmosphere. |  |
| 2.11 | Identify the troposphere. |  |
| 2.12 | Describe the stratosphere |  |
| 2.13 | Identify on a diagram where the mesosphere is located. |  |
| 2.14 | Describe the thermosphere. |  |

## Benchmark 3: Solar Radiation

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Describe how sunlight arrives as electromagnetic waves. |  |
| 3.2 | Explain how radiant energy from the sun provides energy and heat to the troposphere. |  |
| 3.3 | Summarize how the earth’s atmosphere and solar radiation interact. |  |
| 3.4 | Identify what happens when heat is absorbed by gases, liquids, or solids. |  |
| 3.5 | Summarize what happens to light when it passes through the atmosphere. |  |

## Benchmark 4: Atmospheric Conduction and Convection

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Compare and contrast conduction and convection as ways that heat moves around the planet. |  |
| 4.2 | Explain how heat is transferred to other materials. |  |

## Benchmark 5: Atmospheric Balancing

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Summarize the three kinds of energy transfer- absorption, conduction and convection. |  |
| 5.2 | Describe the ocean system. |  |
| 5.3 | Explain how the atmosphere regulates the Earth’s temperature. |  |
| 5.4 | Outline how the atmosphere participates in a number of Bio/Geo/Chemical cycles that involve life itself. |  |

## Benchmark 6: Bio/Geo/Chemical Cycles

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Explain the water cycle. |  |
| 6.2 | Describe the role of solar energy in the water cycle |  |
| 6.3 | Outline the sulfur cycle. |  |
| 6.4 | Describe the nitrogen cycle. |  |
| 6.5 | Explain the carbon cycle. |  |
|  | Identify the differences in the amount of carbon in the troposphere with the amount of carbon in the atmospheres of other planets. |  |

## Benchmark 7: Atmosphere & Climate Change

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 7.1 | Describe the properties of CO2 . |  |
| 7.2 | Explain the chemical composition of the Earth’s atmosphere. |  |
| 7.3 | States how industrial output can interact with the atmosphere through the various Bio/Geo/Chemical cycles, and as a result, can change the way the atmosphere regulates the heat coming from solar radiation. |  |

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

Instructor Signature:

For more information, contact:

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