

## General Course Information

<b>Course Name: Meteorology</b>	
Department: Science	Grade Level(s): 11, 12
Duration/Credits: 1 Semester/0.5 credit	Prerequisites: Successful completion of a high school level science course
BOE Approval Date: December 2022	Course Code: H3170
<b>Course Description:</b>	
The student will use the inquiry method to gain a basic understanding of weather forecasting through a hands-on learning approach. This course covers the elements that govern the weather and climate, characteristics of the atmosphere, the analysis and synthesis of weather data to create forecasts, and severe weather occurrences.	
<b>Course Rationale:</b>	
Today, the job market demands advanced skills in critical thinking and creativity, an ability to use reasoning to make decisions and solve problems, and the drive to learn and improve skills. An understanding of science and the processes of science contribute in an essential way to these applicable life skills.	
<b>Course Objectives:</b>	
<ol style="list-style-type: none"><li>1. The student will locate, label and describe the layers of the atmosphere.</li><li>2. The student will calculate temperature ranges and means for year, month and day.</li><li>3. The student will differentiate between the heating of a solid and a fluid, and make connections to the heating of land, atmosphere, and oceans.</li><li>4. The student will read and analyze scientific articles about meteorological topics.</li><li>5. The student will locate high- and low-pressure cells on a map and interpret them to predict the winds and weather at different locations.</li><li>6. The student will differentiate between humidity and dew point and how it relates to the formation of clouds and precipitation.</li><li>7. The student will apply the heat triangle indicating the heat transfer taking place in water throughout the three states of matter to meteorological processes.</li><li>8. The student will compare the weather associated with the four different fronts.</li><li>9. The student will collect daily weather data, construct a Station Model, and</li></ol>	

- track the data collected in order to derive an accurate weather forecast.
10. The student will compare the weather conditions associated with the middle-latitude cyclone and the hurricane.
11. The student will relate atmospheric data with weather conditions associated with severe weather.

### **Standards Alignment:**

- 9-12.PS1.A.5 Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
- 9-12.PS4.A.1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
- 9-12.ESS2.A.1 Develop a model to illustrate how Earth's interior and surface processes (constructive and destructive) operate at different spatial and temporal scales to form continental and ocean-floor features.
- 9-12.ESS2.A.2 Analyze geoscientific data to make the claim that one change to Earth's surface can create changes to other Earth systems.
- 9-12.ESS2.A.4 Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
- 9-12.ESS2.C.1 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
- 9-12.ESS2.D.1 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
- 9-12.ESS3.A.1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- 9-12.ESS3.D.1 Analyze geoscientific data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.
- 9-12.ESS3.D.2 Predict how human activity affects the relationships between Earth systems in both positive and negative ways.

### **Priority Standards**

- 9-12.ESS2.A.2 Analyze geoscientific data to make the claim that one change to Earth's surface can create changes to other Earth systems.
- 9-12.ESS2.A.4 Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
- 9-12.ESS2.C.1 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
- 9-12.ESS3.A.1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- 9-12.ESS3.D.2 Predict how human activity affects the relationships between Earth systems in both positive and negative ways.