

## Curriculum Guide

**Course 516:** Meteorology

**Level:** Grade 11 and 12

### 1. Course Structure

This semester course meets daily. There are no supplementary laboratory periods because investigations are incorporated into regular class periods.

### 2. Intended Audience

Meteorology is an elective course intended for junior and senior students.

### 3. Course Goals

Students in this course will develop a solid understanding of meteorology, including local weather and optical phenomena, and the processes that drive them.

### 4. Course Objectives

Content:

- I. Hurricanes
- II. New England Weather and Forecasting
- III. Global Climate
- IV. Atmospheric Optics
- V. Broadcast Meteorology

Skills:

- Students will demonstrate habits of mind characteristic of physicists, including the constant questioning of how and why things happen in the physical world around them.
- Students will demonstrate an ability to effectively answer questions and clearly explain how and why certain meteorological phenomena occur.
- Students will become proficient in observing, recording, analyzing, and effectively reporting meteorological data collected in the laboratory, outside, and on the Internet.
- Students will prepare and present forecasts, taking into consideration not only what the forecast is, but what is important to the audience.
- Students will develop written, oral, and visual presentation skills

### 5. Essential Questions

- I. Hurricanes

- What conditions are required for hurricane formation and development?
  - What tools are available to forecasters trying to predict hurricanes
  - What social considerations must be accounted for when forecasting hurricanes?
- II. New England Weather and Forecasting
- What geographic features of New England effect local weather?
  - What global phenomena affect local weather?
  - How do you use local observations to forecast the weather?
  - How do you use the Internet to forecast local weather?
- III. Global Climate
- What is El Nino/La Nina?
  - What are human's impacts on global warming?
- IV. Atmospheric Optics
- Why is the sky blue?
  - How does a rainbow form?
  - How does water interact with the spectrum of white light?
- V. Broadcast Meteorology
- How do you create a forecast?
  - How do you meet your audience's needs?

## 6. Course Outline/ Curriculum Map

### Quarter One

- I. Hurricanes
- Follow hurricanes using the Internet
  - Learn about moisture variable
  - Atmospheric Pressure
  - On-line forecasting tools
- II. New England Weather and Forecasting
- Local Geography
  - Interpreting Weather Maps
  - Cold Fronts/Warm Fronts
  - Wind and Pressure
  - Creating a Forecast

### Quarter Two

- III. Global Climate
- El Nino/La Nina
  - Global Warming

- IV. Atmospheric Optics
  - Electromagnetic Spectrum
  - Refraction and Reflection
  - Rainbows, Coronas, Glories
  - Blue Sky
  - Green Flash

Throughout Semester

- V. Broadcast Meteorology
  - Preparing a Forecast
  - Radio Broadcasting
  - Television Broadcasting

## 7. Course Text and Other Materials

The text for this course is:

- Thomson Brooks/Cole, Meteorology Today, C. Donalds Ahrens, 8<sup>th</sup> Edition, 2007

Support materials include:

- Class Web-Site
- Weatherbug Achieve Web-Site (part of School WeatherNet)
- Green Screen Studio
- ThompsonNow On-line Textbook Support

## 8. Instructional Methods and Course Activities

Content will be conveyed through:

- Class dialogue and discussion
- Interactive lecture demonstrations
- PowerPoint Presentations
- On-line simulation and Tutorial Activities
- Instructor-designed laboratory investigations

## 9. Learning Strategies

- Class discussion and problem-solving, accompanied by laboratory experiences, are designed to illustrate and reinforce principles learned in class.
- Computer-assisted instruction (interactive lecture demonstrations, microcomputer based laboratories) will be used to increase learning and to support a variety of learning styles.
- The development and effective use of a problem solving strategy will also be used.

## **10. Assessment**

The assessment of students will occur through:

- Evaluation of class preparation and participation
- Laboratory performance including observations, analysis, and reporting of data
- Formal testing and quizzing
- Major Project (including radio and TV forecasts) grades

## **11. Course Evaluation**

The assessment of this course will occur through:

- Feedback from current students and graduates
- A formal student questionnaire