

**Course Name: PHY-118 Introduction to Meteorology**

Date Updated: 4/2022

Credit Hours/week: 4 hrs./wk. – 4 cr.

BEGINNING: SPRING 2022

Catalog Description:

This course is an Introduction to Meteorology, based on the Laws of Physics. Topics include:

- The Scientific Method
- Scientific Measurement of scalars and vectors
- The Earth’s Atmosphere: origin, layers and composition
- Thermodynamics and its impact on circulation in the atmosphere and oceans
- Pressure Gradients and their impact on the movement of air masses and fronts
- Climate Oscillations, Climate Change and the Chemistry of pollution.

Prerequisite: MAT-016 or MAT-120 or equivalent Math placement basis

Text: Vincent Marchese / Christine Staver, Meteorology Laboratory Manual -12th Edition

Supplementary Material: Textbook/e-textbook (8th edition!), Lab Manual, pencil & colored pencils, calculator

Syllabus:

Text Sections	Topics
Chapter 1	Components & Vertical Structure of Atmosphere
Chapter 2	Latent Heat & Conduction, Convection & Radiant Energy, Radiation, Seasons
Chapter 3	Air Temperature, Air Temperature & Exam Review, Exam 1
Chapter 4	Dew Point vs. Humidity, Frost, Fog & Clouds
Chapter 5	Stability, Precipitation
Chapter 6	Gas Law, Air Pressure & Surface Charts, Forces & Winds Aloft, Vertical Air Motion
Chapter 7	Atmospheric Motion Local, Atmospheric Motion Global, Atmospheric/Ocean Interaction
Chapter 8	Air Masses & Stationary Fronts & Exam review, Cold Fronts, Warm Fronts, Drylines, Occluded Fronts & Cyclones, Convergence, Divergence & Upper Level Support, Exam 2
Chapter 9	Forecasting Techniques & Time Range, Forecasting with Surface Charts
Chapter 10	Thunderstorms, Supercells, Lightning & Tornadoes
Chapter 11	Hurricane Anatomy, Hurricane patterns & Cut-Off Lows, Exam 3
Chapter 12	Global Climates
Chapter 13	Past Climates, Natural Events & Man-Made Activities
Chapter 14	Air Pollution
	Final Project Presentations

Students are expected to adhere to the policies of the County College of Morris. These can be accessed at: (insert link here)

## **Statement of Expected Course LEARNING OUTCOMES**

- Use the Scientific Method: Hypothesis, Procedure, Data, Analysis, Conclusion,
- Describe differences in Scientific theories and Scientific laws,
- Measure with the Metric System, use a 24-hour clock, locate with latitude and longitude,
- Measure directional winds, precipitation, temperature, pressure, humidity and dew points,
- Demonstrate how the transfer of energy impacts atmospheric stability
- Demonstrate the impact of pressure gradients and the Coriolis Effect on air masses and ocean currents
- Read and interpret surface and upper-level maps,
- Forecast weather for short-range windows,
- Recognize conditions for cyclonic storms, thunderstorms, tornadoes and hurricanes,
- Discuss climate change over centuries and the impact of air pollution today.