

# COURSE SYLLABUS

<b>Course Title:</b>	Meteorology	<b>Date submitted:</b>	Spring 2014 (AAC:14-12)
<b>Department:</b>	Mathematics and Science		
<b>Curriculum:</b>	Science		
<b>Course Descriptors:</b> Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.	<b>Course Code:</b> (eg. ACC 101)	MET*101	<b>Prerequisites:</b>  None
	<b>Course Type:</b>	L	
	A: Clinical B: Lab D: Distance Learning I: Individual/Independent L: Lecture N: M: Seminar Internship P: Practicum U: Studio X: Combined Lecture/Lab Y: Combined Lecture/Clinical/Lab Z: Combined Lecture/Studio		
	<b>Elective Type:</b>	G/LAS/S	<b>Corequisites:</b>  None
	AH: Art History E: English FA: Fine Arts FL: Foreign Language G: General HI: History HU: Humanities LAS: Liberal Arts & Sciences M: Math S: Science SS: Social Science		
	<b>Credit Hours:</b>	3	
	<b>Developmental:</b> (yes/no)	No	
	Lecture:	3	
	Clinical:	0	
	Lab:	0	
Studio	0		
Other:	0		
TOTAL:	3		
<b>Contact Hours:</b>			
<b>Class Maximum:</b>	24	<b>Other Requirements:</b>  Technology skills	
<b>Semesters Offered:</b>	F/Sp		
<b>Catalog Course Description:</b>	The concepts of atmospheric temperature, pressure, humidity, wind, and how these factors are measured. Investigation of the physical processes of the atmosphere in such areas as heat transfer, condensation and precipitation, stability-instability and lapse rate. Study of atmospheric circulation and weather changes. Course includes essentials of climatology. Examination includes selected meteorological applications of meteorology.		
<b>Topical Outline:</b> List course content in outline format.	Lecture: 1. Introduction <ol style="list-style-type: none"> <li>a. Basic Metrics</li> <li>b. Scientific Notation</li> <li>c. TV Weather Report</li> <li>d. Science of Meteorology</li> </ol> 2. The Atmosphere <ol style="list-style-type: none"> <li>a. Origin of the Earth's Atmosphere</li> <li>b. Composition of the Atmosphere</li> <li>c. Vertical Structure of the Atmosphere</li> <li>d. Ozone Layer</li> <li>e. Upper Atmosphere</li> </ol> 3. The Earth in Space		

- a. Earth and Sun
- b. Earth-Sun Relationships
- c. Cause of the Seasons
- d. Solar Energy
- e. Greenhouse Effect
- f. Energy Budget of the Earth
- 4. Pressure, Density, and Wind
  - a. Pressure Defined
  - b. Measurement of Pressure
  - c. Vertical Pressure Gradient
  - d. Hydrostatic Approximation
  - e. Horizontal Pressure Gradient
  - f. Isobars and Wind Speeds
  - g. Measurement of Wind
  - h. Geostrophic Wind
  - i. Gradient Wind
  - j. Effect of Friction
- 5. Water in the Atmosphere
  - a. Phases of Water
  - b. Humidity Defined
  - c. Capacity and Saturation
  - d. Dew Point
  - e. Vapor Pressure and the Boiling Point
  - f. Humidity Parameters
  - g. Measurement of Humidity
- 6. Atmospheric Stability
  - a. Environmental Lapse Rate
  - b. Dry Adiabatic Lapse Rate
  - c. First Criteria for Stability
  - d. Moist Adiabatic Lapse Rate
  - e. Full Stability Criteria
  - f. Inversions and Stability
- 7. Clouds and Precipitation
  - a. Cloud Microstructure
  - b. Cloud Measurement
  - c. Cloud Classification
  - d. Formation of Precipitation
  - e. Types of Precipitation
- 8. Atmospheric Circulation Systems
  - a. Scales of Atmospheric Motion
  - b. Global Scale Circulation
  - c. Cyclones and Anticyclones
  - d. Monsoon Circulation
  - e. Small Scale Circulations
- 9. Mid-Latitude Low Pressure Systems
  - a. Air-Masses
  - b. Development and Evolution of the Wave Cyclone
  - c. Upper Atmosphere
- 10. Weather At Its Worst
  - a. Reading a Weather Map
  - b. Observation, Analysis and Prediction
  - c. Organization of the National Weather Service
  - d. Long-Range Forecasts

**Outcomes:**

Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they

**Upon successful completion of this course, the student will be able to do the following:**

- 1. identify and manipulate basic metric measurements
- 2. relate the major events in the history of meteorology
- 3. identify the composition, structure, and layering of the atmosphere
- 4. discuss the earth/sun relationship and the energy received from the sun as seasons, greenhouse

<p>have mastered the course content.</p>	<p>effect, and energy budget</p> <ol style="list-style-type: none"> <li>5. list and discuss the effects of pressure, density, and wind on weather phenomena</li> <li>6. demonstrate an understanding of water and its associated atmospheric phenomena</li> <li>7. discuss clouds and precipitation, atmospheric circulation systems and mid-latitude low pressure systems</li> <li>8. identify and discuss unusual or extreme weather phenomena</li> <li>9. define climatology and list basic principles</li> </ol> <p><b>PROGRAM:</b> <i>(Numbering reflects Program Outcomes as they appear in the college catalog)</i></p> <p>N/A</p> <p><b>GENERAL EDUCATION:</b> <i>(Numbering reflects General Education Outcomes as they appear in the college catalog)</i></p> <p><b>8. Scientific Knowledge</b> - Students will gain a broad base of scientific knowledge and methodologies in the natural sciences. This will enable them to develop scientific literacy, the knowledge and understanding of scientific concepts and processes essential for personal decision making and understanding scientific issues.</p> <p><b>Demonstrates:</b> Consistently recalls and correctly applies discipline-specific terms, relevant theories, laws, and concepts to analyze and explain scientific information.</p> <p><b>Does Not Demonstrate:</b> Inconsistently recalls or incorrectly applies discipline-specific terms, relevant theories, laws, and concepts to analyze or explain scientific information.</p>
<p><b>Evaluation:</b> List how the above outcomes will be assessed.</p>	<p><b>Assessment will be based on some or all of the following criteria:</b></p> <p>Written quizzes Examinations Brief written papers on selected topics Field trip and report may be required</p>
<p><b>Instructional Resources:</b> List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.</p>	<p><b>Required:</b> <b>Desired:</b> Trip to local TV station weather center</p>
<p><b>Textbook(s)</b></p>	<p>Ahrens, <i>Meteorology Today</i>, 8<sup>th</sup> ed.; Cengage Learning</p>