Bemidji State University

GEOG 3125: Weather and Climate

A. COURSE DESCRIPTION

Credits: 3
Lecture Hours/Week: 0
Lab Hours/Week: 0
OJT Hours/Week: *.*
Prerequisites: None
Corequisites: None

MnTC Goals: Goal 03 - Natural Science, Goal 10 - People/Environment

Weather is the study of the atmosphere over short time scales, while climate is the study of long-term weather trends. The study of weather is commonly termed meteorology, which is actually a branch of physics associated with fluid dynamics. Climate is associated with statistical procedures and analyses. This course examines the geographic patterns and processes of global climate and weather, as well as topics such as global climate change, global climate models, and extreme weather events. Students learn about the Earth's atmosphere; energy budgets and astronomical controls on weather processes; oceanic and atmospheric circulation; the basic atmospheric parameters; atmospheric hazards such as tornadoes, hurricanes, hail, and lightning; and global climate change issues. [Core Curriculum Goal Area(s) 3 & 10]

B. COURSE EFFECTIVE DATES: 08/24/2014 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Understand the composition and structure of the atmosphere.
2. Understand solar radiation, the seasons, energy balances, and implications for temperature.
3. Describe atmospheric pressure and what is responsible for wind.
4. Understand atmospheric moisture and precipitation processes.
5. Understand what drives atmospheric circulation.
6. Describe the difference air masses affecting US weather.
7. Symbolize and understand weather phenomena such as fronts and mid-latitude cyclones.
8. Demonstrate familiarity with atmospheric hazards such as hurricanes, tornadoes, lightning, hail, and thunderstorms.
9. Relate basic techniques for forecasting the weather.
10. Understand the impact of humans on the atmosphere through issues such as air pollution and urban heat islands.
11. Demonstrate an understanding of Earth's climate.
12. Develop comprehension of global climate change and its myriad environmental ramifications.
D. LEARNING OUTCOMES (General)

1. Demonstrate an understanding of Earth/Sun geometry, energy budgets, and resultant influences on weather.
2. Annotate a general knowledge of Earth’s atmosphere.
3. Diagram global climate changes and implications for regional weather patterns.
4. Apply a broad range of geographic, weather, and climate specific vocabulary.
5. Differentiate among various atmospheric hazards, such as tornadoes, hurricanes, hail, lightning and hail, their causal mechanisms, and societal impacts.
6. Explain the basic characteristics of the atmosphere, including primary parameters, atmospheric and oceanic circulation, precipitation generation, and geographic controls on weather.
7. Describe the geographic and socioecological impacts of climate change.
8. Discuss the functional components and the sociocultural and environmental implications of various climate change adaptation and mitigation strategies.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students’ laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 10 - People/Environment

1. Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
2. Discern patterns and interrelationships of bio-physical and socio-cultural systems.
3. Describe the basic institutional arrangements (social, legal, political, economic, religious) that are evolving to deal with environmental and natural resource challenges.
4. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted