Minnesota State University Moorhead

GEOS 330: Elementary Meteorology

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

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

The basic elements of weather, including temperature, pressure, condensation and precipitation, air masses and fronts, vorticity, jet streams and storms. MnTC Goal 3 and 10.

B. COURSE EFFECTIVE DATES: 12/28/2001 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Refraction, reflection, diffraction and other atmospheric phenomena,
2. Structure and chemistry of Earth's atmosphere
3. Boyles law, adiabatic processes, chemistry of water solubility in air
4. Coriolis effects and the physics of winds and global circulation
5. Synoptic weather of mid-latitude cyclones
6. Hurricanes, tornadoes, lightning
7. Climate zones and relationship to global circulation and water bodies
8. Past climate and climate change
9. Impact of human activities on global and local climate

D. LEARNING OUTCOMES (General)

1. Student can explain the basic causes of cloud formation, precipitation, and winds.
2. Student can read and interpret a weather map.
3. Student can explain how we know particular aspects of weather, climate, or atm. process.
4. Student can engage in critical thinking and reasoning as applied to meteorological problems.
5. Student can understand and interpret clouds and wind patterns in the field.
6. Student can read and interpret a variety of relevant graphs and diagrams.
7. Students can solve a variety of problems involving humidity, air temperature, atmospheric lapse rate, and adiabatic cooling.
8. Student can address in written and oral forms how meteorological knowledge and reasoning methodology informs selected political, environmental, or social questions.
9. Students can explain how energy and natural law influence a wide range of Earth systems and how humans can influence those systems.

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

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.
5. Propose and assess alternative solutions to environmental problems.
6. Articulate and defend the actions they would take on various environmental issues.

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. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted