Metropolitan State University

PHYS 105 : Air, Weather and Climate

A. Course Description

Credits: 4

Prerequisites:

MATH 115 College Algebra
OR
MATH 120 Precalculus
OR
STAT 201 Statistics I

Lab Hours/ Weeks: Corequisites: None

Lecture Hours/ Week :

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

This course is an introduction to the atmospheric sciences, including meteorology, climatology, and atmospheric chemistry. This course emphasizes scientific method, human impact on the environment, and the climate and weather in Minnesota. Includes lab. Intended for general education students and students majoring in Life Sciences Teaching.

B. Course Effective Dates: 05/09/2010 - 05/04/2011 05/05/2011 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Apply the vocabulary, concepts and methods of meteorology and climatology to current and historical cases, including analysis of daily weather charts, interpretation of the Mauna Loa carbon dioxide record, EPA maps of sulfur deposition, hurricane events, and similar scientific examples.
2. Articulate and defend the actions they would take on various environmental issues.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Demonstrate mastery of the concepts, knowledge and vocabulary of atmospheric sciences at the level necessary for informed citizenship and success in teaching General Science at the grades 5-8 level.
5. Demonstrate quantitative reasoning skills and the ability to use arithmetic, algebra and elementary statistics at a level appropriate for graduates of a bachelor degree programs.
6. Demonstrate understanding of scientific facts and theories in meteorology, climatology and atmospheric chemistry.
7. Describe the basic institutional arrangements (social, legal, political, economic, etc.) that are evolving to deal with environmental and natural resource challenges.
8. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
9. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.
10. Formulate and test hypotheses by performing experiments in atmospheric science, including the collection of data, statistical and graphical analysis of results, and an interpretation of its sources of error and uncertainty.
11. Propose and assess alternative solutions to environmental problems.
12. Understand and explain environmental issues relate to air pollution and climate change, and be able to apply that knowledge to the evaluation of alternative human activities.

E. Learning Outcomes (MN Transfer Curriculum)
Goal 03 - Natural Science

1. 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.
2. Demonstrate understanding of scientific theories.
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.

Goal 10 - People/Environment

1. Propose and assess alternative solutions to environmental problems.
2. Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
3. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
4. Articulate and defend the actions they would take on various environmental issues.

G. Special Information

Note: First day attendance required except by instructor permission. Math prerequisite may be taken concurrently.