A. Course Description

Credits: 2

Prerequisites:

MATH 115 College Algebra
OR
MATH 120 Precalculus

Lab Hours/ Weeks: Corequisites: None

Lecture Hours/ Week :

MnTC Goals: Goal 03 - Natural Science , Goal LS - Upper Division Liberal Studies , Goal 10 - People/Environment

This course is intended for Chemistry and Environmental Science majors; this course contributes to the Category 2 electives for the Chemistry major and Physical Science Core Courses for Environmental Science. This two-credit lab course must be taken concurrently with CHEM311 Environmental Chemistry. This course continues the introduction of the techniques, specialized equipment, instrumental methods and safety procedures that was begun in CHEM 112. Students get hands-on experience with the instrumentation, equipment, and hazardous material procedures. Students will learn techniques relevant to the study of atmospheric and water chemistry. Students will gain experience with bench analytical techniques such as titrations and instrumental analysis using mass spectrometry and atomic absorption.

B. Course Effective Dates: 12/15/2015 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Be able to use critical and analytical thinking in problem solving.
2. Properly follow procedures for safe handling and use of chemicals.
3. Critically interpret and evaluate results. Be able to quantify uncertainties and limitations in measurements.
4. Utilize a variety of instrumentation and bench chemistry techniques in the laboratory.

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 LS - Upper Division Liberal Studies

None

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. Discern patterns and interrelationships of bio-physical and socio-cultural systems.
4. Describe the basic institutional arrangements (social, legal, political, economic, religious) that are evolving to deal with environmental and natural resource challenges.
5. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
6. Articulate and defend the actions they would take on various environmental issues.

G. Special Information

None