

# Minnesota State University Moorhead

## GEOS 415: Reading Geochemical Fingerprints

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

GEOS 115 - Physical Geology

Corequisites: None

MnTC Goals: None

This course addresses the geochemical processes by which the Earth has become chemically differentiated, the impact of that differentiation on humans past and present, and the ways by which chemical fingerprints can be used to understand past human activities. Students can expect to learn about ore and soil-forming processes, processes for chemical and isotopic differentiation in the lithosphere, hydrosphere and atmosphere, statistical methodologies for studying chemical differences, analytical methods for measuring chemical and isotopic properties of earth materials, influence of geographic distribution of resources on human occupation, and the use of chemical information in archaeological studies. Students will participate in solving geochemical and archaeological puzzles using chemical, mineralogical and textural information.

**B. COURSE EFFECTIVE DATES:** 01/02/2002 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Geochemistry to track stone
2. Geochemistry to understanding pottery
3. Geochemistry in understanding glass
4. Geochemistry in environmental problems
5. Geochemical partitioning and chemical principles
6. Weathering and soil formation
7. Isotopes
8. Statistics in Geochemistry
9. Analytical methods in Geochemistry

### D. LEARNING OUTCOMES (General)

1. Students will be able to interpret and explain geochemical data as it pertains to archaeological and environmental problems
2. Students will understand and explain basic geochemical processes
3. Students will understand and explain the working and principles of important analytical tools
4. Students will be able to present explanations of how geochemistry can be used in archaeological or environmental problems in both written and oral forms

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted