

# Minnesota State University Moorhead

## GEOS 303: Petrology

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 3

OJT Hours/Week: \*.\*

Prerequisites:

GEOS 115 - Physical Geology AND GEOS 302 - Mineralogy

Corequisites: None

MnTC Goals: None

This course examines how sedimentary, igneous, and metamorphic rocks form, focusing specifically on the chemical and textural information that reveals information about Earth's past and present.

Understanding of petrology is foundational to geology and this course is prerequisite for several upper level geology courses.

### B. COURSE EFFECTIVE DATES: 08/15/2006 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Students will be able to recognize key features of minerals and identify rock-forming minerals in hand sample.
2. Student can use key tools such as phase diagrams, miller indices, Herman-Maugin index, and the concept of space and point groups to discuss and explain the character and behavior of minerals
3. Student can use phase diagrams to discuss and explain the behavior of minerals and melts and to predict mineral compositions and proportions given system composition and temperature.
4. Students understand and can explain how valence state and cation size influence the substitution of elements into various minerals, particularly pyroxenes and feldspars.
5. Students can explain the characteristics and occurrence in minerals of different types of bonds
6. Students can explain energy levels, bonding, and valence in terms of a simple orbital-filling model for atoms

### D. LEARNING OUTCOMES (General)

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted