

11/20/2006

COLLEGE OF SCIENCE AND HEALTH
ENVIRONMENTAL SCIENCE
COURSE OUTLINE

1. TITLE OF COURSE AND COURSE NUMBER: Mineralogy & Petrology
ENV 270, 3 credits

2. DESCRIPTION OF THE COURSE: This course provides an introduction to the study of Earth Materials – rocks and minerals – their description, classification and origin.

3. COURSE PREREQUISITES: ENV 115

4. COURSE OBJECTIVES: To provide students with an introduction to the identification, classification and interpretation of the occurrence of rock-forming minerals and rocks. To provide the essentials of crystallographic theory and practice sufficient to understand the underlying structure of minerals; and, to relate the occurrence of various rock types to current plate tectonic theory.

5. STUDENT LEARNING OUTCOMES:
Students should be able to:
 1. Effectively express themselves in written and oral form on topics dealing with Earth materials.
 2. Demonstrate the ability to think critically about Earth material issues through either writing or discussion.
 3. Locate and use information on Earth material topics from a variety of sources, including peer-reviewed literature and electronic sources.
 4. Demonstrate the ability to integrate knowledge of Earth materials and their significance in a coherent and meaningful manner.
 5. Work effectively with others in gathering research information.
 6. Be able to identify the major types of rock-forming minerals and rock under both field and laboratory conditions.
 7. The basic principles of the identification of rocks and minerals in thin section – optical mineralogy.
 8. Relate fundamental mineral properties to their underlying crystallographic structure.
 9. Be able to place the petrology of rock within their fundamental plate tectonic context.

6. TOPICAL OUTLINE OF THE COURSE CONTENT:
 - I. Historical Development of Mineralogy and Petrology

Mineralogy
 - II. Fundamental of Crystallography
 - a. External habit vs internal structure

- III. Physical Properties & Occurrence of Minerals
 - a. The identification of minerals in hand specimen
 - b. The silicate minerals
 - c. The non-silicate minerals

IV. Gems

Petrology

V. Classification of Rocks

VI. Characteristics, Origin and Classification of Igneous Rocks

VII. Characteristics, Origin and Classification of Sedimentary Rocks

VIII Characteristics, Origin and Classification of Metamorphic Rocks

Rocks and Minerals in Thin Section

IX. Principles of Optical Mineralogy

7. GUIDELINES/SUGGESTIONS FOR TEACHING METHODS AND STUDENT LEARNING ACTIVITIES:

Lecture, class discussion, oral presentations.

8. GUIDELINES/SUGGESTIONS FOR METHODS OF STUDENT ASSESSMENT (STUDENT LEARNING OUTCOMES):

Students are assessed through class discussion and participation, two written examinations; a research paper and presentation; and laboratory reports.

9. SUGGESTED READINGS, TEXTS, OBJECTS OF STUDY:

Sen, Gautam, 2001, "Earth's Materials", Pearson Education, ISBN 0130812951, 542 pp.

Handouts as appropriate

10. BIBLIOGRAPHY OF SUPPORTIVE TEXTS AND OTHER MATERIALS:

Dietrich, R.V., and Skinner, B.J., 1979, "Rocks and Rock-Forming Minerals," John Wiley and Sons, 336 pp.

Dietrich, R.V., and Skinner, B.J., 1990, "Gems, Granite and Gravels: Knowing and Using Rocks and Minerals," Cambridge University Press, 173 pp.

Gribble, C.D., and Hall, A.J., 1985, "A practical introduction to optical mineralogy," 249

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pp.

Klein, C., and Hurlbut, C.S., 1985, "Manual of Mineralogy (after James D. Dana), Wiley, 596 pp.

11. PREPARER'S NAME AND DATE: Richard Pardi, November, 2006
12. ORIGINAL DEPARTMENTAL APPROVAL DATE: November 2006
13. REVISER'S NAME AND DATE:
14. DEPARTMENTAL REVISION APPROVAL DATE: