

I. CATALOG DESCRIPTION

- A. Department Information:  
Division: Science & Math  
Department: Geology  
Course ID: GEOL 200  
Course Title: Rocks and Rock Minerals  
Units: 4  
Lecture: 3 hours  
Laboratory: 3 hours  
Prerequisite: GEOL 100 or GEOL 101

B. Catalog Description

An introduction to the techniques of field identification of the principal rocks and rock-forming minerals through hand specimen examination. Discussions of the major classes of rocks and their origins. Field trips are an integral part of the class.

C. Schedule Description:

An introduction to the techniques of field identification of the principal rocks and rock-forming minerals through hand specimen examination. Discussions of the major classes of rocks and their origins. Field trips are an integral part of the class.

- II. Number Of Times Course May Be Taken For Credit: One

III. EXPECTED OUTCOMES FOR STUDENTS

Upon completion of the course, the student will be able to:

- A. identify the major rock-forming minerals as they appear in rocks,  
B. distinguish with a minimum of 70 percent accuracy, a representative selection of rock minerals and major rock types,  
C. describe the origins of most of the major rock units, and, if provided with the information concerning the boundary relationships of rock units, reconstruct the geologic events of a specific region.  
D. understand the major rock-forming processes (igneous, sedimentary, and metamorphic) and apply these in analyzing the origin of any given rock or mineral sample.

IV. CONTENT:

- A. Minerals and their Properties  
1. Physical Properties  
2. Frequency of mineral groups  
3. Mineral Identification  
B. Rock-Forming Minerals  
1. Silica and Silicates  
2. Non-silicate Minerals  
C. Igneous and Pyroclastic Rocks  
1. Origin and chemical character of Magmas  
2. Plutonic Rocks  
3. Near-surface Intrusive Rocks  
4. Extrusive rocks  
D. Sedimentary Rocks  
1. Weathering; an essential first step  
2. Detrital or clastic sedimentary rocks  
3. Bio-Chemical sedimentary rocks  
4. Diagenesis

- E. Metamorphic Rocks and Migmatites
    - 1. Metamorphic Processes
    - 2. Non-Foliated Metamorphic rocks
    - 3. Foliated Metamorphic rocks
    - 4. "Mixed" rocks
  - F. Other "Rocks" and Miscellaneous material:
    - 1. Vein and Dike Rocks
    - 2. Meteorites and related rocks
    - 3. Weathering Products
    - 4. Fulgurites and other special conditions
- V. METHODS OF INSTRUCTION:
- A. Methods of instruction will vary from instructor to instructor, but may include lecture, directed discussions, research papers, small-group projects, discussion groups, audio-visual aids including computer-generated lecture outlines, lecture demonstrations, and field trips. Student assignments outside of class will be equivalent to 4-6 hours per week and may include reading, computer assisted instruction, writing assignments, short research assignments, special tutorial sessions, group study sessions, and/or individual preparation for objective exams.
  - B. Field Trips are expected to be an integral part of the Laboratory experience in this class.
- VI. TYPICAL ASSIGNMENTS:
- Assignments will vary from instructor to instructor but will typically include reading assignments in the textbook, Chapter exercises from the text or instructor prepared exercises, and topic review essays. Outside reading and reports on special topics pertaining to specific areas of interests may be required.
- A. Reading Assignments
    - 1. Selected assignments from the textbook
    - 2. Articles covering current events in geology (landslides, earthquakes, volcanic eruptions, floods) as well as long-term events (for example, natural resource depletion, environmental effects of mining and processing ores).
  - B. Writing Assignments
    - 1. Selected chapter exercises from the textbook.
    - 2. Instructor-prepared exercises, especially those involving illustrations (maps, charts, diagrams, cross-sections) and their analysis.
    - 3. A written term project, either a research paper or a group project, showing synthesis of the concepts and processes covered in the course.
  - C. Example
 

Choose one of the magazine or newspaper articles on the reading list and analyze the following:

    - 1. Scientific accuracy
    - 2. Topic of study in this course
    - 3. What was reinforced as learned in this course
    - 4. What was new information for you
    - 5. Prepare a written summary and 3-5 minute class presentation.
- VII. EVALUATION:
- Methods of evaluation will vary from instructor to instructor, but may include true-false tests, multiple choice tests, fill-in tests, sentence completions, short essay questions, or term projects; or combinations of the above. Each student will be expected to be able to accurately identify rock samples and be able describe their mode of origin and geologic significance. Grading may be either comparative within a class or may be based on an absolute scale to fairly and accurately represent student effort and comprehension, according to the best judgement of the instructor. All of the students in each class will be graded by the same standard.

- A. Methods of evaluation:
1. Written quizzes and/or tests of a variety of types of questions from among true-false, multiple choice, fill-in, sentence completion, and short essay.
  2. Written exercises.
  3. Written summaries of magazine or newspaper articles.
  4. Laboratory assignments.
  5. Performance in the field, including the journal.
  6. Performance on the term project.
- B. Frequency of evaluation:
1. Quizzes are given in lecture at weekly or bi-weekly intervals.
  2. Exams are given on at the conclusion of each 1/3 of the course basis and culminates with a comprehensive final exam.
  3. Exercises are assigned on a frequency to support comprehension of material, as deemed appropriate by the instructor.
  4. Typically, the class will take two field trips each semester.
- C. Typical exam questions
1. Discuss the range of silica content in Igneous rocks and what factors are thought to be involved in determining that content?
  2. In the list below, identify the minerals that are major Igneous Rock-Forming Minerals.

|                |             |
|----------------|-------------|
| a. Plagioclase | f. Corundum |
| b. Kaolinite   | g. Chlorite |
| c. Chalcedony  | h. Garnet   |
| d. Calcite     | i. Gypsum   |
| e. Hornblende  | j. Fluorite |
  3. Identify the minerals in the display set by name?
  4. Describe the basis for the classification of sedimentary rocks:
  5. Describe the basis for the classification of Metamorphic rocks

VIII: TYPICAL TEXTS:

- Deer, W. A., et al, *An Introduction to the Rock-Forming Minerals*, 2<sup>nd</sup> ed., Addison Wesley Publishing Co., 1992
- Dietrich, R. V. and B. J. Skinner, *Rocks and Rock Minerals*, 1<sup>st</sup> ed., John Wiley and Sons, New York, NY, 1979
- Fritzen, D. K., *The Rock-Hunter's Field Manual; A Guide to Identification of Rocks and Minerals*, Harper & Row, New York, NY, 1999.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: NONE