

**LITHOLOGY 51-206
SPRING, 2010**

INSTRUCTOR:

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TEXT:

Petrology: Igneous, Sedimentary, and Metamorphic, 3rd Ed.
by Blatt, Tracy and Owens

COURSE POLICIES:

A. Attendance:

Lectures constitute a major part of the material covered on exams. So, your attendance and note taking will have a significant effect on your grade.

B. Lab:

We will have weekly (50 point) identification quizzes on groups of 25 rocks and minerals. For quiz and test purposes, the list of minerals and rocks and their chemical formulas and compositions, is cumulative throughout the mineralogy-lithology sequence. We will cover in order, plutonic rocks, volcanic rocks, sedimentary rocks, and metamorphic rocks. Following the weekly quizzes there may be short discussions in the lab on how to identify rocks in hand sample and in the field, and how to systematically record your observations.

Oral tray reports consisting of groups of nine minerals and rocks (worth 40 points each) will require knowing names, compositions, occurrence, mode of origin, and uses of all rocks and minerals. Tray reports may be given in the lab each week after the weekly quiz. A weekly tray report sign-up sheet will be posted in the lab (H216).

C. Exams:

1. Lectures:

There will be four (200 point) exams on materials covered in lectures. They will be unit tests on plutonic rocks, volcanic rocks, sedimentary rocks and metamorphic rocks

2. Lab:

The weekly identification quizzes are required of all students. The oral tray reports are based on individual effort, and will constitute a major part of the lab grade. A minimum of eight tray reports are required for an A or A- in the course.

D. Grades:

Your grade is based on the total points you earn in the course. The grade is weighed approximately 50% on lecture and 50% on lab scores.

A = >1401; A- = 1349 – 1400

B+ = 1288 – 1348; B = 1227 - 1287; B- = 1166 – 1226

C+ = 1105 – 1165; C = 1044 – 1104; C- = 983 - 1043

D+ = 922 – 982; D = 861 – 921; D- = 800 - 860

F = 0 – 799

LITHOLOGY 51-206 COURSE OUTLINE

Introduction to Rocks

Chapters

A. General Distribution and Abundance

PART I. IGNEOUS ROCKS

A. Classification Schemes

1. Color
2. Texture
3. Mineralogy
4. Chemistry

B. Plutonic Rocks

1. Classification
2. Mafic Rocks
 - a. Nature and Occurrence
 - b. Origins and Differentiation Trends
3. Felsic Rocks
 - a. Nature and Occurrence
 - b. Origins
 - c. EXAM

C. Volcanic Rocks

1. Classification and Identification
2. Mafic Rocks
 - a. Nature and Occurrence
 - b. Pillow Lavas – Flood Basalts – Shield Volcanoes
 - c. Origins
3. Felsic Rocks
 - a. Classification and Identification
 - b. Composite Volcanoes (Andesites)
 - c. Ash-flow Volcanoes (Rhyolites)
 1. Tuffs, Welded Tuffs, Flows
 2. Volcanogenic Sediments
 - d. Origins

D. EXAM

PART II. SEDIMENTARY ROCKS

A. Classification (distinction between clasts, matrix and cement)

1. Detrital
2. Chemical

B. Chemical Weathering

1. Influence on the composition of sediments in the source area
2. Influence on the composition of sediments in the deposition area

C. Sedimentary Facies

1. Clastic Facies
 - a. Sandstone, siltstone, mudstone, shale facies

- 2. Carbonate Facies
 - a. Dunham's Classification

D. EXAM

PART III. METAMORPHIC ROCKS

A. Definition and Classification

- 1. Metamorphic Processes
- 2. Types of Metamorphism

B. Contact Metamorphism

- 1. Characteristics and Recognition of Contact Metamorphic Rocks
- 2. The Concept of Metamorphic Facies

C. Dynamic (Cataclastic) Metamorphism

- 1. Characteristics and Recognition of Cataclastic Rocks
- 2. The Role of Cataclasis in Metamorphism

D. Regional Metamorphism

- 1. Characteristics and Recognition of Regionally Metamorphosed Rocks
- 2. Progressive (Barrovian) Metamorphism of fine-grained clastic sedimentary

rocks

- 3. Metamorphism of Sandstones and Limestones

E. EXAM