

**El Paso Community College**  
**Syllabus**  
**Part II**  
**Official Course Description**

<b>SUBJECT AREA</b>	<u>Geology</u>								
<b>COURSE RUBRIC AND NUMBER</b>	<u>GEOL 2411</u>								
<b>COURSE TITLE</b>	<u>Mineralogy</u>								
<b>COURSE CREDIT HOURS</b>	<table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><b>4</b></td> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>:</b></td> <td style="text-align: center;"><b>3</b></td> </tr> <tr> <td style="text-align: center;">Credits</td> <td style="text-align: center;">Lec</td> <td></td> <td style="text-align: center;">Lab</td> </tr> </table>	<b>4</b>	<b>3</b>	<b>:</b>	<b>3</b>	Credits	Lec		Lab
<b>4</b>	<b>3</b>	<b>:</b>	<b>3</b>						
Credits	Lec		Lab						

**I. Catalog Description**

Studies mineral crystallography, chemistry, classification, identification, and occurrence. Includes the genesis, classification, and identification of igneous, sedimentary, and metamorphic rocks. **Prerequisites: CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112. (3:3). Lab fee.**

**II. Course Objectives**

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

- A. Recognize the important physical properties of minerals in a hand sample and explain how these properties relate to atomic structure, bonding, and chemical composition
- B. Describe the basic atomic structure and atomic bonding of the common minerals in the Earth's crust
- C. Explain the basic processes of crystal growth, crystal defects, solid solution, exsolution, and polymorphism and recognize common types of twinning
- D. Recognize the morphology and common symmetry elements of the six crystal systems, identify the crystallographic axes and angles for each system, and identify the standard symmetry symbols (Hermann-Mauguin notation)
- E. Determine interfacial angles and note their constancy
- F. Determine the Miller Indices of common crystal faces and crystal forms.
- G. Show interfacial angles, crystal faces, crystal forms, and symmetry elements on stereographic projections
- H. Analyze the chemistry of the common mineral groups and identify the chemical formula for specific minerals in each group
- I. Relate how Bowen's Reaction Series determines the sequence of magmatic crystallization and explain how the silicate structure and chemical composition change with temperature for both the continuous and discontinuous series
- J. Identify the basic minerals and processes of formation of igneous rocks
- K. Identify the basic minerals and processes of formation of sedimentary rocks and the relate the sequence of minerals precipitating from seawater
- L. Identify the processes of formation of metamorphic rocks and relate the common metamorphic index minerals to pressures and temperatures reached during metamorphism
- M. Use ternary diagrams to plot chemical composition and mineralogy of both magmas and rocks and use these diagrams for classification
- N. Use phase diagrams to show how mineral composition changes as pressures and temperatures of formation change

- O. Relate Snell's Law and describe how a mineral's indices of refraction will determine relief, extinction angles, and birefringence when viewed with a petrographic microscope
- P. Explain how the speed of light will vary along crystallographic axes in non-isotropic minerals and relate that to uniaxial and biaxial minerals
- Q. Identify the parts of a petrographic microscope and use it to aid in mineral identification
- R. Recognize the primary rock forming minerals in this section.
- S. Describe common analytical techniques used in mineralogy, including X-ray diffraction, X-ray fluorescence, scanning electron microscopy, and electron microprobe analysis

### **III. Evaluation**

The procedure for determining the final grade will be decided by the instructor and presented to the student in the syllabus.

Possible grading procedures may include:

- A. Combined lecture and laboratory exams and quizzes
- B. Separate lecture exams and quizzes
- C. Separate laboratory exams and quizzes
- D. Laboratory exercises
- E. Homework
- F. Individual and/or group projects
- G. Written work, including research papers

Grading: 90 and above = A; 80-89.9 = B; 70-79.9 = C; 60-69.9 = D; below 60 = F

### **IV. Disability Statement (Americans with Disabilities Act [ADA])**

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Room C-112 (831-2426); TM Room 1400 (831-5808); RG Room B-201 (831-4198); NWC Room M-54 (831-8815); and MDP Room A-125 (831-7024).

### **V. 6 Drop Rule**

Students who began attending Texas public institutions of higher education for the first time during the fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.