Las Positas College
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Course Outline for GEOL 1L

PHYSICAL GEOLOGY LABORATORY

Effective: Fall 2017

I. CATALOG DESCRIPTION:
GEOL 1L — PHYSICAL GEOLOGY LABORATORY — 1.00 units

Laboratory course to supplement the physical geology lecture course. Introduction to the materials and techniques of geology. Includes minerals, rocks, topographic and geologic maps, structural geology, identification and interpretation of landforms, geologic time and relative age dating analysis, etc.

1.00 Units Lab

Prerequisite
GEOL 1 - Physical Geology
(May be taken concurrently)
or

GEOL 5 - Environmental Geology: Hazards & Disasters
(May be taken concurrently)
or

GEOL 7 - Environmental Geology: Resources, Use Impact & Pollution
(May be taken concurrently)
or

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lab Hours:	54.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:
Before entering the course a student should be able to:

A. GEOL1
B. GEOL5
C. GEOL7

IV. MEASURABLE OBJECTIVES:
Upon completion of this course, the student should be able to:

A. Explain, discuss and apply the principles of the scientific method
B. In order to demonstrate conceptual understanding: explain, discuss, analyze, identify and/or interpret the fundamental concepts, principles, and interactions of Earth's systems applicable to the Geological Sciences.
C. Demonstrate an understanding of the Earth through the identification and evaluation of physical mineral samples.
D. Demonstrate an understanding of the Earth through the identification and evaluation of physical igneous, sedimentary and metamorphic rock samples.
E. Demonstrate an ability to communicate complex course concepts effectively in writing and diagrams through the analysis and evaluation of geologic materials, tools and/or equipment.
F. Demonstrate the ability to read, interpret, analyse, solve, measure, assess and/or construct topographic and geologic maps and answer questions pertaining to geologic processes.

V. CONTENT:
A. Topographic maps
B. Mineral identification
C. Relative and absolute dating
D. Geologic time
E. Plate Tectonics
F. Earthquakes

G. Volcanoes
H. Rock identification
I. Geological structures
J. Geological maps and cross sections
K. Surface water processes
L. Ground water processes
M. Coastal processes
N. Desert processes
O. Glacial processes
P. Field Trips

VI. METHODS OF INSTRUCTION:

A. **Demonstration** -
B. student group exploratative and inter-student questioning (thinking and working it through with other students)
C. Rock, Mineral and Map Exercises
D. Internet in-class and for use on homework
E. **Lab** - laboratory specimens and equipment
F. **Lecture** -
G. Directed student exploration
H. Laboratory Manual Exercises
I. **Written exercises and case studies** - Rock, Mineral and Map Exercises
J. online animations and videos
K. pre-lab assignments

VII. TYPICAL ASSIGNMENTS:

A. Rock and/or Mineral Labwork
    1. Test all of the minerals in the lab-set.
    2. Figure out and confirm what identifying properties are distinctive and characteristic of each mineral.
    3. For each mineral with several varieties, figure out what distinguishing properties are common for all varieties
B. Pre-Lab Assignments/Quizzes (open book)
    1. Look up the following information and vocabulary
    2. Take the online open-book, prelab quiz after you have finished looking up the pre-lab information
C. In-Lab Practice Quizzes (typically open book); complete the practice quiz based on your pre-lab work and your lab exercise notes.
D. Field Work and/or Lab Report; for example: attend or conduct a field trip following the instructor's directions with submitted field report.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Research Projects
4. Papers
5. Oral Presentation
6. Projects
7. Field Trips
8. Simulation
9. Group Projects
10. Class Participation
11. Class Work
12. Home Work
13. Lab Activities
14. Other:
    a. Laboratory exercises, assignments and reports (typically at least one of these occurs every week or lab meeting).
    b. PreLabs, Exercises and/or Quizzes
    c. Lab Practical Exams applying laboratory content and techniques
    d. In-Lab Quizzes
    e. Field Trip Report(s)
    f. Attendance and/or participation (at the instructor’s discretion)

B. **Frequency**

1. Each week, at least one of the following: laboratory exercises, assignments, quizzes, or reports (for a total of at least 8 through the course of the term)
2. PreLabs and PreLab Quizzes; at the instructor’s discretion
3. Laboratory Practical Exams; at least two, covering
    a. Rock and Mineral Lab Practical
    b. Geologic and Topographic Lab Practical Exam including structural geology, relative age dating, construction of geologic and topographic cross-sections, vertical exaggeration, geologic and geologic interpretation of topographic and geologic map data, etc.
4. In-Lab Practice Quizzes; weekly - or at instructor's discretion.
5. Research Papers, Portolios, Papers, Oral Presentations, Projects, Field Trips, Simulations, Group Projects, Class Participation, homework - at the instructor's discretion; could be one or more.

IX. TYPICAL TEXTS:

1. Editor Illustrator (2015). *AGI/NAGT Laboratory Manual in Physical Geology* (12th ed.). Upper Saddle River, New Jersey: Prentice-Hall Publishers.
2. Zumberge, . (2014). *Physical Geology Laboratory Manual* (16th ed.). San Francisco, CA: McGraw-Hill Publisher.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. A. Lecture textbook B. Colored pencils C. Ruler and protractor D. Calculator capable of addition, subtraction, multiplication and division E. Workbook and/or handouts produced by the instructor (at the instructor’s discretion) F. LPC computer access and/or print card G. Computer/Internet access at home or ability to access the LPC on-campus facilities