Las Positas College
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Course Outline for GEOL 3L

HISTORICAL GEOLOGY LABORATORY

Effective: Fall 2019

I. CATALOG DESCRIPTION:
GEOL 3L — HISTORICAL GEOLOGY LABORATORY — 1.00 units

Laboratory exercises to support and reinforce the Historical Geology lecture course. Includes lab exercises in rocks and minerals, relative and absolute age-dating, biostratography, radiometric dating, the construction of geologic histories from geologic map data, types of fossil preservation, fossil identification and morphology of the common and important fossils throughout the Geologic Time Scale. Formation and development of the earth, its oceans, atmosphere and life through time. Prerequisite: Geology 3 lecture (may be taken concurrently with this lab).

1.00 Units Lab

Prerequisite
GEOL 3 - Historical Geology
(May be taken concurrently)

Grading Methods:
Letter or P/NP

Discipline:
- Earth Science

	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. GEOL3

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. Apply, explain, discuss, analyze, identify and/or interpret the concepts and principles of Historical Geology including: Fossilization; Ecology, Evolution and Extinction; Plate Tectonics; Geologic Time and Dating Methods; and The Supercontinent Cycle and Paleo-Climate
C. Identify and differentiate representative physical samples of fossils and rocks
D. Apply knowledge of tectonic processes to interpret, analyse and evaluate geologic events
E. Interpret, evaluate and analyse geologic maps, cross sections and stratigraphic columns
F. Apply principles of relative dating to interpret, evaluate and explain sequences of geologic events
G. Communicate complex course concepts effectively in writing and diagrams through the analysis of laboratory exercises

V. CONTENT:
A. Apply, explain, discuss, analyze, identify and/or interpret the concepts and principles of Historical Geology including: Fossilization; Ecology, Evolution and Extinction; Plate Tectonics; Geologic Time and Dating Methods; and The Supercontinent Cycle and Paleo-Climate through Laboratory Activities on:
1. Basic introduction to identifying rocks and minerals
2. Identify major groups of fossil organisms
3. Examine modes of fossil preservation
4. Constructing and interpreting cladograms
5. Interpret geologic maps
6. Interpret geologic cross sections
7. Interpret stratigraphic columns
8. Relative dating and interpreting sequences of geologic events
9. Introduction to absolute dating
10. Paleogeographic reconstruction
11. Application of the Scientific Method
12. Field Trips

VI. METHODS OF INSTRUCTION:

A. **Lab** - laboratory exercises and activities; lab manual, CD-ROM (if available), publisher's website (if available), instructor's website (if available and may include the use of campus online software) - and when offered as a hybrid course, the aforementioned is in addition to on-campus laboratory activities and exercises.
B. Specimens (e.g., fossils)
C. **Discussion** - At the instructor's discretion, and dependent on the type of laboratory exercise or activity, discussion may be held in-class as part of a lab with the entire class, or in small lab groups, and/or online in Discussion Boards or course chatrooms to facilitate lab group work as appropriate.
D. Presentations at the instructor's discretion, and may include: 1. Cd-rom/dvd images and animations 2. slides 3. Demonstrations 4. Video clips 5. Internet and online materials, websites, quizzes, bulletin boards, etc.
E. **Field Trips** - at the instructor’s discretion

VII. TYPICAL ASSIGNMENTS:

A. Fossil identification
B. Construction of Geologic Cross-Sections
C. Deciphering Geologic Histories
D. Interpreting ancient environments
E. Deciphering phyllogenetic trees
F. Lab activities
G. Field trips
H. Lab and/or field reports
I. Memorizing the Geologic Time Scale

VIII. EVALUATION:

Methods/Frequency

A. Exams/Tests
B. Quizzes
C. Research Projects
D. Papers
E. Oral Presentation
F. Projects
G. Field Trips
H. Group Projects
I. Class Participation
J. Class Work
K. Home Work

IX. TYPICAL TEXTS:

1. Poort, J, DeGolyer, and MacNaughton. *Historical Geology; Interpretations and Applications.* 6th ed., Prentice-Hall, 2005.
2. Levin, Harold, and Michael Smith. *Laboratory Studies in Earth History.* 10th ed., McGraw Hill Publishers, 2014.
3. Ritter, S, and M Petersen. *Interpreting Earth History; A Manual in Historical Geology.* 8th ed., WCB McGraw-Hill, 2015.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Study guides/instructions/lab exercises as made available by the instructor
B. Access to the Internet and computers, through the LPC Computer Center, or to a computer at a public library (or a similar institution), or access to a personal computer at home with an Internet connection