Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for GEOL 3

HISTORICAL GEOLOGY

Effective: Fall 2017

I. CATALOG DESCRIPTION:
GEOL 3 — HISTORICAL GEOLOGY — 3.00 units

Formation and development of the earth, its oceans, atmosphere and life through time. Emphasis on the Geologic Time Scale, the fossil record, introductory biostratigraphy, radiometric dating, index fossils, fossil assemblages, paleo-ecology, mass extinctions, types of fossil preservation, paleoclimate, Ice Ages and glacial events through time, paleogeography: plate tectonic configurations throughout time, major events through the scope of Geologic Time, etc.

3.00 Units Lecture

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)

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture 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
1. Explain the scientific method
2. 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.
3. Apply, explain, discuss, analyze, identify and/or interpret the internal and external processes that shape and form the Earth.
4. Apply, explain and/or discuss the rock cycle and identify and describe the basic properties of rocks and minerals.
5. Explain, discuss, analyze, identify and/or interpret the fundamentals, and ramifications, of plate tectonics and Earth's resources.
6. In oder to demonstrate an understanding: explain, discuss, analyze, identify and/or interpret, how geological environments are formed, changed and eroded through geological time.
7. Communicate complex course concepts effectively in writing and diagrams and apply critical thinking and problem solving skills to make informed decisions in life.

B. GEOL5
1. In order to demonstrate a fundamental understanding: explain, discuss, analyze, identify and/or interpret of concepts, principles and interactions of Earth's systems including: the Hydrologic Cycle; the Rock Cycle; Plate Tectonics; Geologic Hazards; and Connectivity between geosphere, atmosphere, hydrosphere and biosphere.
2. Communicate complex course concepts effectively in writing and diagrams through the analysis of laboratory exercises

C. GEOL7
1. Explain, discuss, analyze, identify and/or interpret of concepts, principles and interactions of Earth's systems including: the Hydrologic Cycle; the Rock Cycle; Plate Tectonics; Geologic Hazards; and Connectivity between geosphere, atmosphere, hydrosphere and biosphere.
2. Explain the Scientific Method
3. Communicate complex course concepts effectively in writing and diagrams through the analysis of laboratory exercises

IV. MEASURABLE OBJECTIVES:

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

A. 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
B. Explain, discuss, analyze, identify and/or interpret the formation of, and basic properties of, fossils, minerals and rocks
C. Explain, discuss, analyze, identify, apply and/or interpret the tectonic processes that shape the Earth over geologic time
D. Interpret sequences of geologic events

V. CONTENT:

A. Plate Tectonics
    1. Formation and Origin of the Earth
    2. Driving Mechanisms
    3. Plate Boundaries
    4. Hot Spots
    5. Crustal Evolution and Deformation
    6. Supercontinent Cycle
B. Earth's Materials
    1. Minerals
    2. Igneous, Sedimentary and Metamorphic Rocks
    3. Rock Cycle
C. Fossils
    1. Modes of Formation
    2. Classification
    3. Ecology, Evolution and Extinction
D. Dating Methods
    1. Geologic Time
    2. Relative Dating
    3. Absolute Dating
E. Stratigraphy
    1. Catastrophism and Uniformitarianism
    2. Interpretation of sedimentary rock sequences
F. Paleogeography
    1. Archaean, Proterozoic and Ediacaran geologic and tectonic events
    2. Paleozoic geologic and tectonic events
    3. Mesozoic geologic and tectonic events
    4. Cenozoic geologic and tectonic events
    5. Recent geologic and tectonic events

VI. METHODS OF INSTRUCTION:

A. **Research** - - e.g., for Group Projects and/or for term papers and/or for Discussion Board or Wiki projects.
B. **Student Presentations** - - at the instructor's discretion. May be posted to Class Discussion Boards, Class Wikis, etc.
C. **Classroom Activity** - e.g., through Class Discussion Boards and Class Wikis. etc.
D. **Audio-visual Activity** - - videos and video clips on relevant course-related topics; includes online images and animations; online quizzes with images, etc.
E. **Lecture** - when the course is offered in the traditional on-campus setting. When offered in the online, distance education, lecture material will be accessed through the textbook, online videos, online video clips, web pages on specific topics, etc.
F. **Directed Study** - using the textbook with publisher materials as available (e.g., online flashcards, online animations, etc)
G. **Discussion** - e.g., through Class Discussion Boards and Class Wikis
H. **Projects** - e.g., through Class Discussion Boards, Class Wikis, etc. For either Group or Individual projects, as determined by the instructor.

VII. TYPICAL ASSIGNMENTS:

A. Read Chapters 1 thru 4. Look up the vocabulary words in these chapters and complete online Vocabulary Quiz 1. Use the textbook glossary and index, the Geologic Dictionaries available in the Science Center, and Internet search engines such as Google.
B. Memorize the Eons, Eras and Periods of the Geologic Time Scale
C. Complete the Study Guide questions for Exam 2.
D. Complete the homework assignment and problems on radiometric dating.
E. Read Chapter 15 in the textbook. This topic will not be covered during class time.
    1. Look up all vocabulary for this chapter.
    2. Make sure that you understand the basic geologic processes discussed in this Chapter.
    3. Complete the questions in the Study Guide that refer to the topics in this chapter.
F. Research Paper. Submit a 5-10 page 12-point paper on a geologic topic approved by the instructor.
G. Presentation. Create and present a 5-10 minute presentation on a geologic topic approved by the instructor.
H. Participate in the online class Discussion Board by posting information and links about unusual fossils.
I. Contribute to the online class Wiki and send the instructor an email with the content of your Wiki contributions.

VIII. EVALUATION:

A. **Methods**

    1. Exams/Tests
    2. Quizzes
    3. Research Projects
    4. Papers
    5. Oral Presentation
    6. Projects
    7. Field Trips
    8. Group Projects
    9. Class Participation
    10. Class Work
    11. Home Work
    12. Other:
        a. Homework – includes vocabulary, geography, geologic time scale, textbook CD-ROM if available, and textbook material not covered in class presentations
        b. Quizzes and Midterms
        c. On-Line Quizzes and/or Essays – may use the textbook website quizzes and/or Blackboard Quizzes – online quizzes are at the discretion of the instructor
        d. Term Paper or Student Presentations (instructor's option)
        e. Final examinations – comprehensive, similar layout to quizzes and midterm examinations

B. **Frequency**

1. Homework can be assigned daily, weekly or all at the beginning of the term or only as needed, at the discretion of the instructor
2. Quizzes will be given daily, weekly, bi-weekly or at the discretion of the instructor
3. Quizzes/Midterms/Final Exam/Term Paper – at least 3 or 4 total. For example, there may be 2 midterms, one final exam and one term paper. Or, there may be 4 on-line quizzes, 3 in-class midterms and one in-class final exam.
4. Research Projects, Papers, Oral Presentations, Projects, Field Trips, Group Projects, Class Participation, Class Work- at the instructor's discretion; could be one or more.

IX. TYPICAL TEXTS:

1. King, D. *The Earth Through Time.* 11th ed., Wiley Text Publisher, 2016.
2. Stanley, . *Earth Systems History.* . 4th ed., W.H. Freeman & Company Publishers, 2015.
3. Wicander and Munroe, . *Historical Geology.* 8th ed., Thomson Brooks Cole Publishers, 2016.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. A. Access to the Internet and computers, through the LPC Computer Center, through a public library or some similar institution, or access to a personal computer at home with an Internet connection