

# GEOL M03L: EARTH HISTORY LAB

---

**Originator**

rputnam

**College**

Moorpark College

**Discipline (CB01A)**

GEOL - Geology

**Course Number (CB01B)**

M03L

**Course Title (CB02)**

Earth History Lab

**Banner/Short Title**

Earth History Lab

**Credit Type**

Credit

**Start Term**

Fall 2022

**Catalog Course Description**

Provides hands-on experience identifying fossils, minerals, and rocks. Introduces geologic time, relative age relations in rocks, construction of paleogeographic maps, interpretation of geologic maps and cross sections, and fossil evidence of evolutionary trends throughout geologic time.

**Taxonomy of Programs (TOP) Code (CB03)**

1914.00 - Geology

**Course Credit Status (CB04)**

D (Credit - Degree Applicable)

**Course Transfer Status (CB05) (select one only)**

A (Transferable to both UC and CSU)

**Course Basic Skills Status (CB08)**

N - The Course is Not a Basic Skills Course

**SAM Priority Code (CB09)**

E - Non-Occupational

**Course Cooperative Work Experience Education Status (CB10)**

N - Is Not Part of a Cooperative Work Experience Education Program

**Course Classification Status (CB11)**

Y - Credit Course

**Educational Assistance Class Instruction (Approved Special Class) (CB13)**

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

May be required

**Faculty notes on field trips; include possible destinations or other pertinent information**

Field trips will be to areas of local interest to Earth History such as Long Canyon, Las Lajas Canyon, Malibu Creek State Park, and Sycamore Canyon.

**Grading method**

(L) Letter Graded

**Alternate grading methods**

(O) Student Option- Letter/Pass

(P) Pass/No Pass Grading

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Activity**

**Laboratory**

**Minimum Contact/In-Class Laboratory Hours**

52.5

**Maximum Contact/In-Class Laboratory Hours**

52.5

**Total in-Class**

**Total in-Class**

**Total Minimum Contact/In-Class Hours**

52.5

**Total Maximum Contact/In-Class Hours**

52.5

**Outside-of-Class****Internship/Cooperative Work Experience**

Paid

Unpaid

**Total Outside-of-Class**

Total Outside-of-Class

**Total Student Learning**

Total Student Learning

Total Minimum Student Learning Hours

52.5

Total Maximum Student Learning Hours

52.5

**Minimum Units (CB07)**

1

**Maximum Units (CB06)**

1

**Prerequisites**

GEOL M03 or concurrent enrollment

**Entrance Skills****Entrance Skills**

GEOL M03

**Prerequisite Course Objectives**

GEOL M03-describe and give examples of the interactions between the four basic components of the Earth as a global ecosystem - the atmosphere, hydrosphere, lithosphere, and biosphere.

GEOL M03-apply the scientific method to solve geologic problems such as determining the age of the Earth; distinguishing data, observations, and evidence from interpretation.

GEOL M03-explain the immensity of geologic time, define the geologic eras, and place some well-known events in the context of the geologic time scale.

GEOL M03-determine the relative ages of rocks from an outcrop or a diagram by analyzing their relationships, and combine their ages and processes of formation to construct the geologic history of an area; explain how absolute ages of rocks and fossils are determined.

GEOL M03-explain the theory of plate tectonics by describing the three types of plate boundaries, the landforms, and processes that occur at each type with reference to appropriate examples.

GEOL M03-classify and distinguish between igneous, sedimentary, and metamorphic rocks and analyze rock distributions to reconstruct the paleogeography, paleoclimate, and geologic history of an area.

GEOL M03-identify types of fossils and fossilization processes, and demonstrate how fossils are used to determine paleoenvironments, ecology, and relative ages of rocks; explain the importance of the fossil record as evidence of evolution and extinction events.

GEOL M03-compare mass extinctions in the history of life and critique proposed theories for their causes by assessing the evidence.

GEOL M03-describe the major tectonic events, rock-forming processes, and major events in the evolution of life recorded by fossils for each major geologic time period.

GEOL M03-explain the relationships between the supercontinent cycle, paleogeography, and paleoclimate and how these changes affect evolution of life.

**Requisite Justification****Requisite Type**

Prerequisite

**Requisite**

GEOL M03

**Requisite Description**

Course in a sequence

**Level of Scrutiny/Justification**

Closely related lecture/laboratory course

**Student Learning Outcomes (CSLOs)****Upon satisfactory completion of the course, students will be able to:**

- |   |                                                                                              |
|---|----------------------------------------------------------------------------------------------|
| 1 | interpret paleogeographic and geologic maps of a region to interpret its geologic evolution. |
|---|----------------------------------------------------------------------------------------------|

**Course Objectives****Upon satisfactory completion of the course, students will be able to:**

- |   |                                                                                                                                                                            |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | prepare a model of the geologic time scale, place some well-known events in the context of the geologic time scale and analyze the roles of these events in earth history. |
| 2 | determine the geologic history of an area by analyzing cross sectional diagrams of rock layers, geologic maps, and field relations in outcrop.                             |
| 3 | distinguish and identify minerals, igneous, metamorphic, and sedimentary rocks and determine the processes and conditions that formed them.                                |
| 4 | interpret the paleoenvironment, paleoecology, paleoclimate, and geologic history of an area using rocks and fossils.                                                       |
| 5 | prepare a paleogeographic map or geologic map by analyzing spatial distribution of rocks and fossils.                                                                      |
| 6 | assess the scientific evidence for evolution and extinction of fossil animal species.                                                                                      |
| 7 | identify and draw sketches of rock features, geologic structures, rock relations, and fossils based on examination of rock outcrops.                                       |
| 8 | use fossil, paleoclimate, glacial, and structural data to reconstruct supercontinents and the stages of their breakup.                                                     |
| 9 | apply concepts and principles of relative and absolute dating to rocks and fossils to determine their ages and interpret sequences of events.                              |

**Course Content****Lecture/Course Content**

N/A

**Laboratory or Activity Content**

- 5% - Geologic time scale
- 7% - Plate tectonics: evidence for supercontinents and their breakup
- 7% - Mineral identification
- 7% - Metamorphic and Igneous rock identification and interpretation
- 12% - Identifying and describing sedimentary rocks and sedimentary structures to interpret past environments
- 7% - Interpreting stratigraphic columns
- 7% - Physical correlation of stratigraphic sections
- 10% - Relative dating principles, sequences of events, and unconformities
- 6% - Absolute dating methods
- 7% - Fossil identification
- 10% - Interpreting geologic maps
- 15% - Field trips: Evaluating local rocks, stratigraphy, and structures to assess the geologic history of our region to.

**Methods of Evaluation****Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):**

- Written expression
- Problem solving exercises

## Skills demonstrations

**Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):**

Essay exams  
 Group projects  
 Laboratory activities  
 Objective exams  
 Problem-solving exams  
 Skills demonstrations  
 Skills tests or practical examinations  
 Other (specify)  
 Classroom Discussion  
 Projects  
 Participation  
 Reports/Papers/Journals

### Other

written lab and field trip reports  
 paleogeographic and geologic map interpretation  
 field sketches and notes  
 stratigraphic column interpretation

## Instructional Methodology

**Specify the methods of instruction that may be employed in this course**

Class activities  
 Collaborative group work  
 Distance Education  
 Field trips  
 Instructor-guided interpretation and analysis  
 Laboratory activities  
 Small group activities  
 Other (specify)

**Specify other method of instruction**

prepare and interpret models, maps, and cross-sections  
 sketch and interpret rock outcrops on field trips

**Describe specific examples of the methods the instructor will use:**

- Lectures and slideshows illustrating skills to be applied in lab
- Demonstration of skills to be applied in lab

## Representative Course Assignments

### Writing Assignments

- Prepare a paleogeographic map or geologic map based on the analysis of spatial distribution of rocks and fossils.
- Record field trip summary and write a report or essay.
- Write narrative geologic histories about a region based on stratigraphic data.

### Critical Thinking Assignments

- Use Google Earth to evaluate rates of plate motion and evaluate past tectonic behavior.
- Analyze ice core data from Vostok Research Station in Antarctica to understand paleoclimate patterns.
- Apply relative dating principles to geologic cross sections to interpret geologic histories.

### Reading Assignments

- Read supporting documentation to geologic maps.
- Read the Global Boundary Stratotype Section and Point (GSSP) of the International Commission on Stratigraphy to become familiar with the boundaries between different time zones.

**Skills Demonstrations**

- Use index fossil occurrence to interpret relative age relations in a region.
- Prepare an interpretive map or cross section by analyzing structural data.
- Collect structural data at local field sites.

**Outside Assignments****Articulation****C-ID Descriptor Number**

GEOL 110L

**Status**

Approved

**Additional C-ID Descriptor(s)**

C-ID Descriptor(s)	Status
GEOL 111 with GEOL M03	Approved

**Equivalent Courses at 4 year institutions**

University	Course ID	Course Title	Units
CSU Fullerton	GEOL 201L	Earth History Supplemental Lab	1
CSU Dominguez Hills	EAR 201	Earth History Laboratory	1
CSU Northridge	GEOL 112	Earth and Life Through Time Lab	1

**Comparable Courses within the VCCCD**

GEOL R114L - Historical Geology Laboratory  
 GEOL V03L - Historical Geology Laboratory

**District General Education****A. Natural Sciences****A2. Physical Science**

Approved

**B. Social and Behavioral Sciences****C. Humanities****D. Language and Rationality****E. Health and Physical Education/Kinesiology****F. Ethnic Studies/Gender Studies****Course is CSU transferable**

Yes

**CSU Baccalaureate List effective term:**

F2011

**CSU GE-Breadth**

**Area A: English Language Communication and Critical Thinking**

**Area B: Scientific Inquiry and Quantitative Reasoning**

**B3 Laboratory Activity**

Approved

**Area C: Arts and Humanities**

**Area D: Social Sciences**

**Area E: Lifelong Learning and Self-Development**

**Area F: Ethnic Studies**

**CSU Graduation Requirement in U.S. History, Constitution and American Ideals:**

**UC TCA**

UC TCA

Approved

**IGETC**

**Area 1: English Communication**

**Area 2A: Mathematical Concepts & Quantitative Reasoning**

**Area 3: Arts and Humanities**

**Area 4: Social and Behavioral Sciences**

**Area 5: Physical and Biological Sciences**

**Area 5C: Laboratory Science**

Approved

**Area 6: Languages Other than English (LOTE)**

**Textbooks and Lab Manuals**

**Resource Type**

Textbook

**Description**

Ossian, Clair Russell. *Insights: A Laboratory Manual for Historical Geology*. 5th ed., Kendall Hunt, 2015.

**Resource Type**

Textbook

**Description**

Ritter, Scott, and Morris Petersen. *Interpreting Earth History: A Manual in Historical Geology*. 8th ed., Waveland, 2014.

## Library Resources

### Assignments requiring library resources

Possible research using the Library's print and online resources, particularly Springer Science.

### Sufficient Library Resources exist

Yes

### Example of Assignments Requiring Library Resources

Write narrative geologic histories about a region based on stratigraphic data.

## Distance Education Addendum

### Definitions

#### Distance Education Modalities

Hybrid (1%–50% online)  
Hybrid (51%–99% online)  
100% online

### Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

### Regular Effective/Substantive Contact

#### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/ discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes. E.g. - Students will use the discussion board in Canvas to discuss how the geosphere and hydrosphere influence each other.
E-mail	Email, class announcements and tools such as "Message Students Who" and "Assignment Comments" in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.



Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> <li>o Recorded Lectures, Narrated Slides, Screencasts</li> <li>o Instructor created content</li> <li>o MC Online Library Resources</li> <li>o Canvas Peer Review Tool</li> <li>o Canvas Student Groups (Assignments, Discussions)</li> <li>o 3rd Party (Publisher) Tools (Mastering Geography)</li> <li>o Websites and Blogs</li> <li>o Multimedia (YouTube, Films on Demand, 3CMedia, Google Earth, Earth.nullschool, etc.)</li> </ul>
Synchronous Dialog (e.g., online chat)	Scheduled synchronous sessions may be organized at the instructor's discretion to demonstrate skills, address problems, and review asynchronous lectures. Synchronous sessions may also be used for students to work on problem sets together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.

**Hybrid (51%–99% online) Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes. E.g. - Students will use the discussion board in Canvas to discuss how the geosphere and hydrosphere influence each other.
E-mail	Email, class announcements and tools such as “Message Students Who” and “Assignment Comments” in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> <li>o Recorded Lectures, Narrated Slides, Screencasts</li> <li>o Instructor created content</li> <li>o MC Online Library Resources</li> <li>o Canvas Peer Review Tool</li> <li>o Canvas Student Groups (Assignments, Discussions)</li> <li>o 3rd Party (Publisher) Tools (Mastering Geography)</li> <li>o Websites and Blogs</li> <li>o Multimedia (YouTube, Films on Demand, 3CMedia, Google Earth, Earth.nullschool, etc.)</li> </ul>
Synchronous Dialog (e.g., online chat)	Scheduled synchronous sessions may be organized at the instructor's discretion to demonstrate skills, address problems, and review asynchronous lectures. Synchronous sessions may also be used for students to work on problem sets together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.

**100% online Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/ discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes. E.g. - Students will use the discussion board in Canvas to discuss how the geosphere and hydrosphere influence each other.
E-mail	Email, class announcements and tools such as “Message Students Who” and “Assignment Comments” in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: o Recorded Lectures, Narrated Slides, Screencasts o Instructor created content o MC Online Library Resources o Canvas Peer Review Tool o Canvas Student Groups (Assignments, Discussions) o 3rd Party (Publisher) Tools (Mastering Geography) o Websites and Blogs o Multimedia (YouTube, Films on Demand, 3CMedia, Google Earth, Earth.nullschool, etc.)
Synchronous Dialog (e.g., online chat)	Scheduled synchronous sessions may be organized at the instructor’s discretion to demonstrate skills, address problems, and review asynchronous lectures. Synchronous sessions may also be used for students to work on problem sets together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.

**Examinations****Hybrid (1%–50% online) Modality**

On campus  
Online

**Hybrid (51%–99% online) Modality**

On campus  
Online

**Primary Minimum Qualification**

EARTH SCIENCE

**Review and Approval Dates****Department Chair**

11/02/2021

**Dean**

11/02/2021

**Technical Review**

11/18/2021

**Curriculum Committee**

12/07/2021

**DTRW-I**

MM/DD/YYYY

**Curriculum Committee**

MM/DD/YYYY

**Board**

MM/DD/YYYY

**CCCCO**

MM/DD/YYYY

**Control Number**

CCC000525323

**DOE/accreditation approval date**

MM/DD/YYYY