

GEOL M02L: PHYSICAL GEOLOGY LAB

Originator

rputnam

College

Moorpark College

Discipline (CB01A)

GEOL - Geology

Course Number (CB01B)

M02L

Course Title (CB02)

Physical Geology Lab

Banner/Short Title

Physical Geology Lab

Credit Type

Credit

Start Term

Fall 2022

Catalog Course Description

Provides hands-on experience in identifying minerals, fossils, as well as igneous, sedimentary, and metamorphic rocks. Introduces topographic and geologic map interpretation and requires students to practice using remote sensing, aerial photographs, and maps to recognize landforms and geologic structures. Emphasizes laboratory and field observation and analysis of geologic data.

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

Will be required

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

Ventura county beaches, Long Canyon (Simi Valley), Wildwood Park (Thousand Oaks), Tarantula Hill (Thousand Oaks), Malibu Creek State Park (Calabasas).

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 M02 or GEOL M02H or concurrent enrollment

Entrance Skills

Entrance Skills

GEOL M02

Prerequisite Course Objectives

GEOL M02- 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 M02- distinguish the Big Bang hypothesis from the solar nebula theory and explain current theories on stellar processes and how solar systems and planets form.

GEOL M02- apply the scientific method to solve geologic problems such as determining the age of the Earth; distinguishing data, observations, and evidence from interpretation.

GEOL M02- describe the Earth's internal layered structure, its composition and properties, and the methods used to study it; identify the internal processes that affect the lithosphere and plate tectonics.

GEOL M02- explain the theory of plate tectonics by describing the three types of plate boundaries, and the landforms and processes that occur at each type with reference to appropriate examples.

GEOL M02- locate the major lithospheric plates on a world map and correlate each type of plate boundary with the major landform that occurs there.

GEOL M02- relate plate tectonic processes to phenomena such as earthquakes and the formation and evolution of Earth's major features: oceans, continents, mountain ranges, and volcanoes.

GEOL M02- distinguish between elements, minerals, and rocks; define the properties of a mineral and recognize the importance of minerals as natural resources and in identifying rocks.

GEOL M02- classify and distinguish between igneous, sedimentary, and metamorphic rocks and describe how they are formed by internal and surface processes on the Earth and on other planets.

GEOL M02- 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.

GEOL M02- identify geologic structures and determine the forces that caused them.

GEOL M02- describe the processes and effects of physical and chemical weathering and mass movements.

GEOL M02- illustrate the hydrologic cycle and identify the variety of environments where erosion, sediment transport, and deposition occur.

GEOL M02- identify river, glacial, desert, and coastal landforms in photographs and describe the surface processes responsible for their formation and evolution.

GEOL M02- recognize and describe the interaction between human activities and the geologic environment; identify the major geologic hazards in the world and possible actions humans could take to avoid or mitigate property damage or loss of life.

Entrance Skills

GEOL M02H

Prerequisite Course Objectives

GEOL M02H-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 M02H-distinguish the Big Bang hypothesis from the solar nebula theory and explain current theories on stellar processes and how solar systems and planets form.

GEOL M02H-apply the scientific method to solve geologic problems such as determining the age of the Earth; distinguishing data, observations, and evidence from interpretation.

GEOL M02H-describe the Earth's internal layered structure, its composition and properties, and the methods used to study it; identify the internal processes that affect the lithosphere and plate tectonics.

GEOL M02H-explain the theory of plate tectonics by describing the three types of plate boundaries, and the landforms and processes that occur at each type with reference to appropriate examples.

GEOL M02H-locate the major lithospheric plates on a world map and correlate each type of plate boundary with the major landform that occurs there.

GEOL M02H-relate plate tectonic processes to phenomena such as earthquakes and the formation and evolution of Earth's major features: oceans, continents, mountain ranges, and volcanoes.

GEOL M02H-distinguish between elements, minerals, and rocks; define the properties of a mineral and recognize the importance of minerals as natural resources and in identifying rocks.

GEOL M02H-classify and distinguish between igneous, sedimentary, and metamorphic rocks and describe how they are formed by internal and surface processes on the Earth and on other planets.

GEOL M02H-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.

GEOL M02H-identify geologic structures and determine the forces that caused them.

GEOL M02H-describe the processes and effects of physical and chemical weathering and mass movements.

GEOL M02H-illustrate the hydrologic cycle and identify the variety of environments where erosion, sediment transport, and deposition occur.

GEOL M02H-identify river, glacial, desert, and coastal landforms in photographs and describe the surface processes responsible for their formation and evolution.

GEOL M02H-recognize and describe the interaction between human activities and the geologic environment; identify the major geologic hazards in the world and possible actions humans could take to avoid or mitigate property damage or loss of life.

GEOL M02H-HONORS: read, analyze and summarize original scientific data, research and primary sources.

GEOL M02H-HONORS: identify, discuss, and explain the Earth science principles and processes that currently affect society.

GEOL M02H-HONORS: apply various field and laboratory techniques to various fields such as, but not limited to, geochemistry, surveying, environmental engineering, hydrology, ecological restoration, bedrock geologic mapping, and coastal geomorphology.

Requisite Justification**Requisite Type**

Corequisite

Requisite

GEOL M02

Requisite Description

Corequisite

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 | identify and analyze sedimentary rocks and construct a paleogeographic map based on their interpretations of depositional environments. |
|---|---|

Course Objectives

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

- | | |
|----|--|
| 1 | identify and describe common minerals, fossils, and rocks and identify which ones are natural resources. |
| 2 | distinguish, classify, and identify igneous, sedimentary, and metamorphic rocks and determine the processes and conditions that formed them. |
| 3 | interpret the paleoenvironment and geologic history of an area using rocks and fossils. |
| 4 | prepare a paleogeographic or geologic map by analyzing spatial distribution of rocks and fossils. |
| 5 | use topographic maps to determine elevation, height, evaluate steepness of slope, locate and identify landscape and cultural features, measure distances; use data from maps to calculate gradients and rates of geological processes. |
| 6 | prepare a model of the geologic time scale, define the geologic eras, place some well-known events in the context of the geologic time scale and analyze the roles of these events in earth history. |
| 7 | recognize and analyze geologic structures using a variety of media: maps, 3-D models, block diagrams. |
| 8 | interpret and analyze geologic maps and cross sections to identify rocks and geologic structures and evaluate geologic hazards for an area. |
| 9 | recognize, identify, measure, and compare landscape features associated with volcanoes, rivers, glaciers, groundwater, coastlines, and/or deserts using aerial photographs, maps, and satellite images. |
| 10 | recognize fluvial, glacial, desert, and coastal landforms on topographic map and aerial photographs; interpret erosional and depositional processes. |
| 11 | identify and draw sketches of rock features, geologic structures, and landforms based on examination of rock outcrops during required field trips. Interpret the observed geologic data and determine the geologic history, paleoclimate, and/or paleoecology of the area. |

Course Content

Lecture/Course Content

n/a

Laboratory or Activity Content

- 5% Geologic time
- 5% Coastal landforms
- 10% Geologic maps
- 10% Geologic structures
- 5% Remote sensing, aerial photos, and volcanic landforms
- 10% Topographic maps and identification of landscape features produced by rivers, glaciers, volcanoes, and desert and coastal processes
- 10% Identifying and interpreting metamorphic rocks
- 10% Sedimentary rocks and paleogeographic maps
- 10% Identifying and interpreting igneous rocks
- 10% Identifying minerals and mineral properties
- 5% Plate tectonics and earthquakes; using the scientific method to test plate tectonic theories
- 10% Fossils

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
- Individual projects
- Laboratory activities
- Objective exams
- Problem-solving exams

Problem-solving homework
Skills demonstrations
Skills tests or practical examinations
Other (specify)
Classroom Discussion
Projects
Participation
Reports/Papers/Journals

Other

written lab and field trip reports
sketches and field notes
models prepared by groups

Instructional Methodology

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

Class activities
Collaborative group work
Demonstrations
Distance Education
Field experience/non-internship
Field trips
Laboratory activities
Modeling
Observation
Small group activities
Other (specify)

Specify other method of instruction

preparing models of geologic structures
sketching rock and landscape features

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

- Summaries of field trips to areas of local geologic interest.
- Written analyses of paleographic mapping exercises.
- Narrative geologic histories based on interpreting geologic cross-sections.

Critical Thinking Assignments

analyze and synthesize geologic data from maps, charts, photographs, and rock outcrops to assess geologic hazards or geologic histories.

prepare a geologic map or paleogeographic map based on analysis of geologic data.

Reading Assignments

- Read instructional manuals on how to operate geologic field tools such as Brunton compasses, theodolites, and GPS units.
- Read the narrative sections of geologic maps, explaining the rock forming and subsequent deformational history of the area.

Skills Demonstrations

evaluate strike and dip of outcrops or models to assess three-dimensional structural relationships.

assess topographic characteristics such as slope, aspect, and elevation from USGS 7.5 Minute Quadrangle Maps

Outside Assignments

Articulation

C-ID Descriptor Number

GEOL 100L

Status

Approved

Additional C-ID Descriptor(s)

C-ID Descriptor(s)	Status
GEOL 101 (with GEOL M02/H)	Approved

Equivalent Courses at 4 year institutions

University	Course ID	Course Title	Units
UC, Santa Cruz	EART 10L	Geologic Principles Lab	1
Cal Poly San Luis Obispo	GEOL 241	Physical Geology Lab	1
CSU Northridge	GEOL 102	Geology of Planet Earth Lab	1
Cal Poly Pomona	GSC 141L	Principles of Geology Lab	1

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:

F1995

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
Putnam, Roger. *Physical Geology Lab Manual for Moorpark College*. Moorpark College, 2021.

Resource Type
Manual

Description
Cronin, Vincent (ed.) and Tasa, Dennis. *Laboratory Manual for Physical Geology*. 12th ed., Pearson, 2021.

Library Resources

Assignments requiring library resources
Research using the Library's print and online resources.

Sufficient Library Resources exist
Yes

Example of Assignments Requiring Library Resources
Utilizing library resources, read journal articles in support of lab exercises.

Distance Education Addendum

Definitions

Distance Education Modalities

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

100% 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: 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.

Primary Minimum Qualification

EARTH SCIENCE

Review and Approval Dates

Department Chair

10/26/2021

Dean

10/27/2021

Technical Review

10/28/2021

Curriculum Committee

11/02/2021

DTRW-I

MM/DD/YYYY

Curriculum Committee

MM/DD/YYYY

Board

MM/DD/YYYY

CCCCO

MM/DD/YYYY

Control Number

CCC000426976

DOE/accreditation approval date

MM/DD/YYYY