GEOL M02H: HONORS: PHYSICAL GEOLOGY

Originator
rputnam

College
Moorpark College

Discipline (CB01A)
GEOL - Geology

Course Number (CB01B)
M02H

Course Title (CB02)
Honors: Physical Geology

Banner/Short Title
Honors: Physical Geology

Credit Type
Credit

Start Term
Fall 2022

Catalog Course Description
Introduces geologic materials and processes that shape the Earth and its environments. Examines global plate tectonic processes and their relationship to earthquakes, volcanoes, mountain building, formation of rocks, minerals and natural resources, and rock structures (folds and faults). Includes a study of mass movements and glacial, river, and coastal processes that form the Earth's landscapes. Emphasizes the relationships between humans and geologic processes. Honors work challenges students to be more analytical and creative though expanded assignments, applied research, and enrichment opportunities. Course Credit Limitations: Credit will not be awarded for both the honors and regular versions of a course. Credit will be awarded only for the first course completed with a grade of “C” or better or “P”. Moorpark College Honors Program requires a letter grade.

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
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

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
Minimum Contact/In-Class Lecture Hours
52.5
Maximum Contact/In-Class Lecture Hours
52.5

Activity

Laboratory

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
Minimum Outside-of-Class Hours
105
Maximum Outside-of-Class Hours
105

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
157.5
Total Maximum Student Learning Hours
157.5

Minimum Units (CB07)
3
Maximum Units (CB06)
3

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	demonstrate understanding of and apply the “9 Big Ideas” of Earth Science as outlined by the National Science Foundation.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	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.
2	distinguish the Big Bang hypothesis from the solar nebula theory and explain current theories on stellar processes and how solar systems and planets form.
3	apply the scientific method to solve geologic problems such as determining the age of the Earth; distinguishing data, observations, and evidence from interpretation.
4	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.
5	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.
6	locate the major lithospheric plates on a world map and correlate each type of plate boundary with the major landform that occurs there.
7	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.
8	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.
9	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.
10	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.
11	identify geologic structures and determine the forces that caused them.

12	describe the processes and effects of physical and chemical weathering and mass movements.
13	illustrate the hydrologic cycle and identify the variety of environments where erosion, sediment transport, and deposition occur.
14	identify river, glacial, desert, and coastal landforms in photographs and describe the surface processes responsible for their formation and evolution.
15	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.
16	HONORS: read, analyze and summarize original scientific data, research and primary sources.
17	HONORS: identify, discuss, and explain the Earth science principles and processes that currently affect society.
18	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.

Course Content

Lecture/Course Content

2% Introduction to Earth as a planet and the scientific method

7% Earthquakes Glaciers: processes, landforms, ice ages, and climate changes

4% Shorelines: coastal processes and landforms

4% Water resources and groundwater

5% Rivers: processes and landforms

4% Mass movements: causes and classification of landslides

3% Weathering processes: interaction of rocks and minerals with atmosphere and hydrosphere

5% Geologic time: the geologic column, determining relative and numeric ages of rocks and fossils

6% Mountain-building and crustal deformation: folds and faults

4% Metamorphic rocks

4% Sedimentary rocks and fossils

6% Volcanoes

4% Igneous rocks

4% Minerals as natural resources and components of rocks

4% Ocean floor features and processes

9% Plate tectonics: Earth’s internal structure and global tectonics

3% Origin and evolution of the universe, stellar processes and formation of elements, origin of Earth and the solar system, age of the Earth.

18% Honors project:Conducting multi-week applied field and or laboratory research project on geoscinece-related topic such as beach profile surveying, stream discharge measurements, stream sediment analysis, burned area sediment flux analysis, or bedrock geologic mapping.

Laboratory or Activity Content

N/A

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
Objective exams
Problem-solving exams
Problem-solving homework

Quizzes
Research papers
Skills demonstrations
Other (specify)
Classroom Discussion
Projects
Participation
Reports/Papers/Journals

Other

Map assignments
Google Earth assignments

Instructional Methodology

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

Case studies
Class activities
Class discussions
Demonstrations
Distance Education
Field trips
Group discussions
Guest speakers
Instructor-guided interpretation and analysis
Laboratory activities
Lecture
Problem-solving examples
Readings
Other (specify)

Specify other method of instruction

Guided group activities and exercises, and problem solving.
Hands-on activities and exercises using fossil, mineral, and rock sets

Describe specific examples of the methods the instructor will use:

- Applied research project in local geology using the skills learned in lecture.
- Think-pair-share exercises evaluating landform types, geologic histories, or other other questions related to Earth science.
- Use guided exercises to track individual and collective resource use.
- Physical demonstration using rocks, minerals, fossils, and models.

Representative Course Assignments

Writing Assignments

- Written case studies about specific Earthquakes, volcanoes, and other natural hazards.
- Journaling exercises reflecting on geology or geologic events.
- Research papers on local geology, California geology, or the geology of national parks
- HONORS: develop posters of geology honors project. Present the honors project in a scientific conference-style poster presentation that contains the following components: abstract, background of the project, results, discussion, conclusions, and references. An example project would be a palentological analysis of the fossils in the Santa Susanna formation in Simi Valley.
- HONORS: write a proposal of your honors project that includes the following components: title, background and purpose, proposed methods, list of materials. An example project would be evaluating the slope angle of beach profiles before and after a period of large surf.
- HONORS: in a two page paper, summarize the purpose, methods, and findings of a geoscience journal article from a publication such as Geology, Geosphere, Nature: Geoscience, or GSA Today.

Critical Thinking Assignments

- Conduct a research project to analyze a volcano and evaluate potential hazards to populated areas.
- Identify plate boundaries on a world map and correlate them with phenomena such as volcanoes, mountain ranges, and earthquakes.
- Analyze the causes of mass movements at La Conchita, California.
- Complete class exercises using rock samples to compare mineral composition and characteristics of different types of rocks.

- Determine processes that formed specific landforms by evaluating rock outcrops, photographs, or satellite imagery via Google Earth.
- HONORS: Apply knowledge gained in the classroom to analyze geology problems. An example would be: Perform sediment size and composition analysis at various beaches in Ventura County.

Reading Assignments

- Read professional journal articles on topics related to lecture.
- Read and analyze the quality of reporting on natural disasters in mainstream media sources.
- Read the textbook.
- HONORS: Conduct a literature review in support of an applied geologic research project.

Skills Demonstrations

- Assess volcanic hazard posed by volcanic landforms by compiling data from Google Earth.
- Evaluate plate boundary types by observing the features located there.
- Determine the relative sequence of geologic events, as shown in a gelogic cross-section.

Outside Assignments

Representative Outside Assignments

- Compile a journal based on reading newspapers and magazines for current events relevant to geology.
- Report on field trip(s) to geologic localities and natural history museums.
- Create a geologic evaluation of a rock outcrop including labeled sketches or photographs that identify rock types, structures, and geologic history.
- Conduct web-based or academic source research on geologic topics such as volcanoes, earthquakes, and plate tectonics.
- Use Google Earth to locate and identify types of plate boundaries using physical features on the continents and sea floor.
- Label plates and distinguish types of plate boundaries on a world map that shows landforms and sea floor features
- HONORS: propose a method of geological investigation using tools beyond the geology textbook. An example would be: Map orientations of faults in the Topanga Formation to evaluate paleo-stress conditions on the Santa Monica Mountains.
- HONORS: design projects and perform literature reviews requiring library and/or Internet research. An example would be: Propose and support a field geology project that is based on measuring particle size of the Conejo Volcanic deposit.

Articulation

C-ID Descriptor Number

GEOL 100

Status

Approved

Additional C-ID Descriptor(s)

C-ID Descriptor(s)	Status
GEOL 101 (with GEOL M02L)	Approved

Equivalent Courses at 4 year institutions

University	Course ID	Course Title	Units
CSU Stanislaus	GEOL 2100	Principles of Geology	3
CSU Fullerton	GEOL 101	Physical Geology	3
Cal Poly Pomona	GSC 1110	Principles of Geology	3
UCSB	EARTH 2	Principles of Physical Geology	4
UCLA	EPS SCI 1	Introduction to Earth Science	4
Cal Poly San Luis Obispo	GEOL 201	Physical Geology	3
CSU Northridge	GEOL 101	Geology of Planet Earth	3

Comparable Courses within the VCCCD

GEOL R101 - Physical Geology
GEOL V02 - Physical Geology

District General Education

A. Natural Sciences

A2. Physical Science
Approved

Effective term:
Fall 2020

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:
Fall 2020

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

B1 Physical Science
Approved

Effective term:
Fall 2020

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 5A: Physical Science
Approved

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Textbook

Description
Tarbuck, Edward J., et al. *Earth: An Introduction to Physical Geology*. 13th ed., Pearson, 2020.

Resource Type
Textbook

Description
Marshak, Stephen. *Essentials of Geology*. 7th ed., Norton, 2021.

Library Resources

Assignments requiring library resources
Research and written report(s) using the Library's print and online resources on topics in the study of volcanos, earthquakes, and plate tectonics.

Sufficient Library Resources exist
Yes

Example of Assignments Requiring Library Resources
HONORS: Research the background literature to support an area of original scientific inquiry.

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

10/25/2021

Dean

10/25/2021

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
CCC000598766

DOE/accreditation approval date
MM/DD/YYYY