

G 001: PHYSICAL GEOLOGY

Originator

rburns

Co-Contributor(s)**Name(s)**

Burns, Richard

Justification / Rationale

Completing suggested changes by curriculum committee and technical review.

Effective Term

Fall 2020

Credit Status

Credit - Degree Applicable

Subject

G - Geology

Course Number

001

Full Course Title

Physical Geology

Short Title

PHYSICAL GEOLOGY

Discipline**Disciplines List**

Earth Science

Modality

Face-to-Face

Catalog Description

This course serves as an introduction to the study of the origin and composition of Earth. Subject matter for this course includes Earth materials and processes such as minerals, rocks, plate tectonics, earthquakes, and volcanoes. Physical Geology provides a broad understanding and appreciation of Earth and its evolution over time. The laboratory component studies aspects of geology on a practical and applied basis with possible field trips that emphasize the study of local geological systems.

Schedule Description

Physical Geology serves as an introduction to the field for majors and those looking to fulfill their general education requirement. Subject matter for this course includes Earth materials and processes such as minerals, rocks, plate tectonics, earthquakes, and volcanoes. Advisory: ENG 001A & MATH 054 IGETC: 5A, 5C

Lecture Units

3

Lecture Semester Hours

54

Lab Units

1

Lab Semester Hours

54

In-class Hours

108

Out-of-class Hours

108

Total Course Units

4

Total Semester Hours

216

Prerequisite Course(s)

Advisory: ENG 001A & MATH 054

Required Text and Other Instructional Materials**Resource Type**

Book

Author

Marshak, Stephen

Title

Earth: Portrait of a Planet

Edition

6th

City

New York

Publisher

W. W. Norton Company

Year

2019

College Level

Yes

Flesch-Kincaid Level

13.5

ISBN #

9780393617511

Resource Type

Book

Author

Marshak, Stephen, Ludman, Allan

Title

Laboratory Manual for Introductory Geology

Edition

4th

City

New York

Publisher

W. W. Norton Company

Year

2019

College Level

Yes

Flesch-Kincaid Level

13.5

ISBN #

9780393617528

Class Size Maximum

28

Entrance Skills

Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

Requisite Course Objectives

ENG 001A-Read, analyze, and interpret varied texts (e.g., literary, digital, visual).

Entrance Skills

Fully utilize a dictionary, thesaurus and other reference materials

Requisite Course Objectives

ENG 001A-Recognize and integrate creative elements of style (e.g., metaphor, analogy, voice, tone).

Entrance Skills

Develop, organize and express complex ideas in both expository and research papers

Requisite Course Objectives

ENG 001A-Write thesis statements, topic sentences, and ideas in an organized way in essays.

Entrance Skills

Demonstrate critical thinking skills when reading, composing and participating in class discussion

Requisite Course Objectives

ENG 001A-Read, analyze, and interpret varied texts (e.g., literary, digital, visual).

Entrance Skills

Demonstrate independent study skills and learning habits.

Requisite Course Objectives

ENG 001A-Participate in the process of developing texts in collaborative and individual settings.

Entrance Skills

Compute stream gradients

Requisite Course Objectives

MATH 054-Solve equations and inequalities that model application problems and interpret these solutions.

MATH 054-Convert between the geometric (Cartesian) and algebraic representations of a linear relation in two variables. Make use of point-slope and slope intercept forms.

Entrance Skills

Convert one type of map scale to another

Requisite Course Objectives

MATH 054-Use properties of equality to solve linear equations in one variable and describe the solution using set notation.

Entrance Skills

Convert from metric to English and vice versa

Requisite Course Objectives

MATH 054-Convert between the geometric (Cartesian) and algebraic representations of a linear relation in two variables. Make use of point-slope and slope intercept forms.

Entrance Skills

Advisory Skill:
Construct focused theses

Requisite Course Objectives

ENG 001A-Write thesis statements, topic sentences, and ideas in an organized way in essays.

Entrance Skills

Advisory skill:
Select, develop and organize ideas in a structured format

Requisite Course Objectives

ENG 001A-Compose texts with complex sentence structure and appropriate diction.

Entrance Skills

Advisory skill:
Adequately negotiate a library to find a variety of source material for research including: 1) periodicals; 2) books; 3) electronic data bases; and 4) on-line sources

Requisite Course Objectives

ENG 001A-Identify and evaluate appropriate research sources, and incorporate them into essays through quotations, summaries, and paraphrases.

Entrance Skills

Advisory skill:
Understand and use basic formulas from geometry including perimeter, area and volume

Requisite Course Objectives

MATH 054-Add, subtract, multiply, divide and simplify rational expressions.
MATH 054-Solve rational equations that simplify to linear or quadratic equations.
MATH 054-Interpret the meaning of the slope of a line as a constant rate of change.
MATH 054-Use dimensional analysis appropriately in applications.

Entrance Skills

Advisory skill:
Understand the meaning of the slope of a line and find an equation for a line using general forms including point slope and slope-intercept

Requisite Course Objectives

MATH 054-Demonstrate use of the method of completing the square to solve quadratic equations of the form where p and q are integers.
MATH 054-Add, subtract, multiply, divide and simplify rational expressions.
MATH 054-Deduce right triangle side lengths using the Pythagorean Theorem and square roots.

MATH 054-Use basic formulas from geometry to find perimeter, area and volume of basic figures.

MATH 054-Use proportionality to discover side lengths of similar triangles.

Course Content

1. Introductory overview.
2. Atoms, elements, and minerals.
3. Igneous rocks, intrusive activity, and the origin of igneous rocks.
4. Volcanism and extrusive rocks.
5. Weathering and soil.
6. Sediments and sedimentary rocks.
7. Metamorphism, metamorphic rocks, and hydrothermal rocks.
8. Time and geology.
9. Mass wasting.
10. Streams and floods.
11. Ground water.
12. Glaciers and glaciation.
13. Deserts and wind action.
14. Waves, beaches, and coasts.
15. Geologic structures.
16. Earthquakes.
17. The Earth's interior.
18. The sea floor.
19. Plate tectonics.
20. Mountain belts and the continental crust.
21. Geologic resources.

Lab Content

- a. Minerals.
- b. Rocks.
- c. The geologic column and relative geologic time.
- d. Map coordinates and land divisions.
- e. Topographic maps.
- f. Geologic interpretation of topographic maps, aerial photographs, and Earth satellite images.
 - i. Geologic work of running water.
 - ii. Groundwater movement, groundwater pollution, and groundwater as a geologic agent.
 - iii. Glaciers and glacial geology.
 - iv. Landforms produced by wind action.
 - v. Modern and ancient shorelines.
 - vi. Landforms produced by volcanic activity.
- g. Structural features of sedimentary rocks.
- h. Faults and earthquakes.
- i. The use of seismic waves to locate the epicenter of an earthquake.
- j. Sea floor spreading in the Atlantic and Pacific Oceans.
- k. Local geologic features including the San Andreas fault zone, Indio Hills, Mecca Hills, and surrounding mountains.

Course Objectives

	Objectives
Objective 1	Identify rocks and minerals, understand how they are formed, and relate their formation to major Earth environments.
Objective 2	Explain diverse weathering and erosional processes and how they relate to particular climates, rock types, and tectonic settings.
Objective 3	Integrate various Earth processes such as mountain building, volcanic activity, and earthquakes into plate tectonic theory.
Objective 4	Define major mineral, water, and energy resource issues and their relationships to environmental concerns.
Objective 5	Understand major geologic hazards and how to avoid or mitigate their effects.
Objective 6	Recognize and analyze geologic features on topographic maps, such as streams and stream valleys, sand dunes, glacial and shoreline features, volcanoes, and fault topography.

Objective 7 Interpret structure and stratigraphy from geologic cross-sections.

Objective 8 Summarize local geology and describe how it relates to lecture and lab topics.

Student Learning Outcomes

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

Outcome 1 Describe the current scientific understanding of the origin of the universe and solar system.

Outcome 2 Describe the processes that operate in and on the Earth, the products produced by these processes and their relation to the theory of plate tectonics.

Outcome 3 Recognize and describe the materials that make up Earth.

Outcome 4 Evaluate and explain applications of the scientific method in geology.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Laboratory	Mineral and Rock identification, hands on activities, critical thinking activities, interpreting geologic phenomenon
Lecture	PowerPoint presentations, hand-written notes, accompanied images, case studies, classroom samples, local samples

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
College level or pre-collegiate essays	Required on homework, laboratory write-ups and tests	In and Out of Class
Tests/Quizzes/Examinations	Tests on both lecture and lab material will be in class. Quizzes on canvas will be completed out of class	In and Out of Class
Laboratory projects	Complete lab activities in groups or as individuals to complement lecture topics and improve quality of learning of geologic processes	In Class Only
Written homework	Weekly assignments from the textbook and online resources	Out of Class Only

Assignments

Other In-class Assignments

Discussion of lecture and laboratory topics

Other Out-of-class Assignments

- Analysis of textbook materials to summarize data for study-guide questions and in-class discussion and testing.
- Gather information on in-depth aspects of physical geology to organize and interpret in research papers/class oral reports.
- Preparation of in-lab work on exercises by review of lab materials.
- Completion of assigned laboratory exercises.
- Student research projects/oral reports on selected aspects of geology to promote a deeper understanding of these aspects and to become familiar with the methodology of library/internet research and writing and speaking on geology topics.
- Completion of online modules provided by book publisher.

Grade Methods

Letter Grade Only

Comparable Transfer Course Information

University System

CSU

Campus

CSU San Bernardino

Course Number

Geol 101

Course Title

Introductory Geology

Catalog Year

2011

COD GE

C1 - Natural Sciences

CSU GE

B1 - Physical Science

B3 - Laboratory Activity

IGETC GE

5A - Physical Science

5C - Science Laboratory

MIS Course Data**CIP Code**

40.0601 - Geology/Earth Science, General.

TOP Code

191400 - Geology

SAM Code

E - Non-Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Credit Course

Approved Special Class

Not special class

Noncredit Category

Not Applicable, Credit Course

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Transferable to both UC and CSU

General Education Status

Not applicable

Support Course Status

Course is not a support course

C-ID

GEOL 101

Allow Audit

No

Repeatability

No

Materials Fee

No

Additional Fees?

No

Approvals**Curriculum Committee Approval Date**

3/03/2020

Academic Senate Approval Date

3/12/2020

Board of Trustees Approval Date

5/15/2020

Course Control Number

CCC000446027

Programs referencing this course

Anthropology AA-T Degree (<http://catalog.collegeofthedesert.eduundefined?key=14/>)

Geography AA-T Degree (<http://catalog.collegeofthedesert.eduundefined?key=15/>)

Environmental Science AS-T (<http://catalog.collegeofthedesert.eduundefined?key=216/>)

Liberal Arts: Math and Science AA Degree (<http://catalog.collegeofthedesert.eduundefined?key=29/>)

Geology AS-T Degree (<http://catalog.collegeofthedesert.eduundefined?key=42/>)

Natural Resources AS Degree (transfer preparation) (<http://catalog.collegeofthedesert.eduundefined?key=71/>)