Cerro Coso College

Course Outline of Record Report

10/07/2021

PHSC C105 : General Earth Sciences

General Information

Author:	• Vivian Baker • Cameron, Scott
Course Code (CB01) :	PHSC C105
Course Title (CB02) :	General Earth Sciences
Department:	Science
Proposal Start:	Spring 2018
TOP Code (CB03) :	(1930.00) Earth Science
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000529056
Curriculum Committee Approval Date:	03/03/2017
Board of Trustees Approval Date:	12/14/2017
External Review Approval Date:	01/09/2012
Course Description:	This lecture and laboratory course covers the study of the Earth as an integrated system. Lecture topics include Earth surface processes, tectonics and mountain building, surface water and groundwater, Earth-Sun relationships and motions, weather, climatic types, soil types, natural hazards, resource management, landforms, and the ocean. An emphasis is placed on understanding geologic issues important to society. Meanwhile, laboratory provides practical experience in field methods and enhancement of lecture topics such as topographic map reading, air photo interpretation, soils, natural hazards, resource management, landforms, Earth-Sun relationships and motions, weather, climatic types and regions, ecosystems, and the ocean. Not open to students who have completed PHSC C101.
Submission Type:	Add Distance Education Add rigor statement for DE.
Author:	No value

Faculty Minimum Qualifications

Master Discipline Preferred:	• Chemistry • Earth Science • Physical Sciences • Physics/Astronomy
Alternate Master Discipline Preferred:	No value
Bachelors or Associates Discipline Preferred:	No value
Additional Bachelors or Associates Discipline Preferred:	No value

Course Development Options

Basic Skills Status (CB08)

Course is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grade Options

- Letter Grade Methods
- Pass/No Pass

☐ Allow Students to Gain Credit by Exam/Challenge

Allowed Number of Retakes

0

Course Prior To College Level (CB21)

Not applicable.

Rationale For Credit By Exam/Challenge

No value

Retake Policy Description

Non-Repeatable Credit

☑ Allow Students To Audit Course

Course Support Course Status (CB26)

No value

Associated Programs

☑ Course is part of a program (CB24)

Associated Program	Award Type	Active
CC Liberal Arts: Mathematics & Science	A.A. Degree Major	Summer 2018 to Fall 2020
CSU General Education (CSU GE Breadth)	Certificate of Achievement	Fall 2020
Intersegmental General Education Transfer Curriculum Certificate of Achievement	Certificate of Achievement	Fall 2020
Liberal Arts: Mathematics & Science Associate in Arts Degree	A.A. Degree Major	Fall 2020
CSU General Education (CSU GE Breadth) (In Development)	Certificate of Achievement	Fall 2021
Intersegmental General Education Transfer Curriculum Certificate of Achievement (In Development)	Certificate of Achievement	Fall 2021

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

No value

Transferability

Not transferable

Transferability Status

Not transferable

Cerro Coso General Education Requirements	Categories	Status	Approval Date	Comparable Course
Area 1.2	Natural Science Physical Sciences	Approved	No value	No Comparable Course defined.

CSU General Education Certification	Categories	Status	Approval Date	Comparable Course
Area B.1	Scientific Inquiry & Quantitative Reasoning Physical Sciences	Approved	No value	No Comparable Course defined.
Area B.3	Scientific Inquiry & Quantitative Reasoning Laboratory	Approved	No value	

Intersegmental General Education Transfer Curriculum	Categories	Status	Approval Date	Comparable Course
Area 5.A	Physical & Biological Sciences Physical Science	Approved	No value	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	108
Total Course Out-of-Class Hours	108
Total Student Learning Hours	216
Faculty Load	0

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Non-Credit Characteristic

No Value

Course Classification Status (CB11)

Credit Course.

Funding Agency Category (CB23)

No value

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Classs
Lecture Hours	3	6
Laboratory Hours	3	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	54
Laboratory	54
Activity	0
Total	108
Course Out-of-Class Hours	
Lecture	108
Laboratory	0
Activity	0
Total	108

Time Commitment Notes for Students

No value

Faculty Load

Extra Duties: 0

Faculty Load: 0

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

ENGLC070 - Introductory Composition

Entrance Skills

Entrance Skills	Description
No value	No value

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Computational Work
Rationale	No value
Methods of Instruction	Demonstration
Rationale	No value
Methods of Instruction	Discussion
Rationale	No value
Methods of Instruction	Group Work
Rationale	No value
Methods of Instruction	In-class writing
Rationale	No value
Methods of Instruction	Laboratory
Rationale	No value

Methods of Instruction	Lecture
Rationale	No value
Methods of Instruction	Outside reading
Rationale	No value
Methods of Instruction	Presentations (by students)
Rationale	No value
Methods of Instruction	Problem Solving
Rationale	No value
Methods of Instruction	Written work
Rationale	No value

Assignments

A. Homework assignments from the relevant textbook chapters. Example: The student is expected to answer instructor assigned questions from the relevant textbook chapters.

B. Readings from the assigned textbook, laboratory manual, and/or other sources. Example: The student is expected to read the textbook chapter and lab manual chapter that will be covered in each week's
lecture and lab.

C. Research paper and presentation Example: The student is required to select a local geophysical landform, research its origin using the concepts learned in class, write a paper summarizing that research, and present a research summary to the class.

D. Written laboratory reports. Example: The student is required to write a lab report that summarizes the experimental methods performed, data collected, and data analysis for each week's lab activity.

E. Data analysis. Example: The student is required to analyze the data collected in a lab activity in order to reach conclusions regarding the lab's physical concepts.

Methods of Evaluation	**Rationale**
Tests	Exams and quizzes evaluate the students' ability to apply concepts and material taught in class. Example: The midterm exam requires the student to diagram the rock cycle and describe the physical characteristics of the rocks formed at each step of the cycle.
Homework	Regular homework assignments reinforce concepts and material taught in class. Example: The student is expected to answer instructor assigned questions from the relevant textbook chapters.
Participation	Reports and presentations evaluate the students' ability to apply concepts taught in class and combine them with new concepts they research on their own. Example: The student is required to select a local geophysical landform, research its origin using the concepts learned in class, write a paper summarizing that research, and present a research summary to the class.
Participation	

Laboratory exercises reinforce concepts and material taught in class.
Example: The student determines the infiltration rate of water through various regolith and soil compositions and then analyzes their impact on flooding.

Other	Laboratory reports and presentations measure the student's ability to perform techniques and assess accuracy and precision where appropriate. Example: The student discusses the identification of rock and mineral samples based on their measurable characteristics.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Tarbuck, E. J., Lutgens, F. K., and Tasa, D..	Earth Science , 12th ed.,	Prentice Hall	2009	

Other Instructional Materials

Description	Tarbuck, E. J., Lutgens, F. K., and Pinzke, K. G.. (2009-01-01 00:00:00.0) Applications and Investigations in Earth Science, Prentice Hall
Author	No value
Citation	No value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

No value

CSLOs

Explain how hydrologic, tectonic, erosional, and atmospheric processes together shape the earth's surface and affect human lives.

Expected SLO Performance: 70.0

Science Liberal Arts: Mathematics & Science AA Degree	Describe the nature of science, the methods applied in scientific investigations, and the value of those methods in developing a rigorous understanding of the physical world.

Summarize the conditions that cause such natural hazards as floods, storms, earthquakes, landslides, volcanoes, and coastal erosion, and explain their impact on humans.

Expected SLO Performance: 70.0

Analyze the impact of humans on the natural environments and research such local environ-mental issues as earthquake hazards, flash flooding, air pollution, groundwater pollution, and environmental planning.

Expected SLO Performance: 70.0

Analyze and reach valid conclusions from analysis of graphs, geographic diagrams, statistics, and maps. Expected SLO Performance: 70.0

Science Liberal Arts: Mathematics & Science AA Degree	Apply algebraic, graphical, numerical, and other methods to solve applied problems in the areas of mathematics, natural sciences, computer graphics, and computer animation.

Construct diagrams that accurately explain and demonstrate such earth science processes as the hydrologic cycle, the rock cycle, and the plate tectonic cycle. Expected SLO Performance: 70.0

Perform standard field methods in physical geology and geomorphology, such as reading topographic maps, constructing topographic profiles and cross-sections, and geologic map and air photo interpretation. Expected SLO Performance: 70.0

Social Science IGETC PLOs	Communicate scientific results by applying the appropriate scientific method, including experimental and empirical methodologies characteristic of science and modern methods and tools used in scientific inquiry through the use of graphs, oral communications, and writings.
Social Science PLOs for CSU GE COA	Communicate scientific results by applying the appropriate scientific method, including experimental and empirical methodologies characteristic of science and modern methods and tools used in scientific inquiry through the use of graphs, oral communications, and writings.

Outline

Course Outline

A. Introduction to Earth Science
1. What Is Earth Science?
2. Earth Science, People, and the Environment
3. The Nature of Scientific Inquiry
4. Scales of Space and Time in Earth Science
5. Early Evolution of Earth's Spheres
6. A Closer Look at the Geosphere
7. Earth as a System

B. Minerals: Building Blocks of Rocks
1. Minerals: The Building Blocks of Rocks
2. Elements: The Building Blocks of Minerals
3. Why Atoms Bond
4. Properties of Minerals
5. Mineral Groups
6. Mineral Resources

C. Rocks: Materials of the Solid Earth
1. Earth as a System: The Rock Cycle
2. Igneous Rocks: "Formed by Fire"
3. Sedimentary Rocks: Compacted and Cemented Sediment
4. Metamorphic Rocks: New Rock from Old
5. Resources from Rocks and Minerals

D. Weathering, Soil, and Mass Wasting
1. Mechanical Weathering
2. Chemical Weathering
3. Rates of Weathering
4. Soil
5. Controls of Soil Formation
6. The Soil Profile
7. Classifying Soils
8. Soil Erosion
9. Weathering Creates Ore Deposits

10. Mass Wasting: The Work of Gravity
11. Mass Wasting and Landform Development
12. Controls and Triggers of Mass Wasting
13. Classifying Mass-Wasting Processes
14. Slump
15. Rockslide
16. Debris Flow
17. Earth flow
18. Slow Movements

E. Running Water and Groundwater
1. Earth as a System: The Hydrologic Cycle
2. Running Water
3. Stream flow
4. The Work of Running Water
5. Stream Channels
6. Base Level and Stream Erosion
7. Shaping Stream Valleys
8. Depositional Landforms
9. Drainage Patterns
10. Floods and Flood Control
11. Groundwater: Water Beneath the Surface
12. Distribution and Movement of Groundwater
13. Groundwater
14. Springs
15. Wells
16. Artesian Wells
17. Environmental Problems Associated with Groundwater
18. The Geologic Work of Groundwater

F. Glaciers, Deserts, and Wind
1. How Glaciers Move
2. Glacial Erosion
3. Glacial Deposits
4. Glaciers of the Ice Age
5. Some Indirect Effects of Ice Age Glaciers
6. Causes of Glaciations
7. Deserts
8. Geologic Processes in Arid Climates
9. Basin and Range: The Evolution of a Desert Landscape
10. Wind Erosion
11. Wind Deposits

G. Earthquakes and Earth's Interior
1. What Is an Earthquake?
2. San Andreas Fault: An Active Earthquake Zone
3. Seismology: The Study of Earthquake Waves
4. Locating an Earthquake
5. Measuring the Size of Earthquakes
6. Destruction from Earthquakes
7. Can Earthquakes Be Predicted?
8. Earth's Layered Structure

H. Plate Tectonics: A Scientific Theory Unfolds
1. Continental Drift: An Idea Before Its Time
2. The Great Debate
3. Plate Tectonics: The New Paradigm
4. Divergent Boundaries
5. Convergent Boundaries
6. Transform Fault Boundaries
7. Testing the Plate Tectonics Model
8. Measuring Plate Motion
9. What Drives Plate Motion?
10. Plate Tectonics into the Future

I. Volcanoes and Other Igneous Activity
1. The Nature of Volcanic Eruptions
2. What Is Extruded During Eruptions?
3. Volcanic Structures and Eruptive Styles
4. Living in the Shadow of a Composite Cone
5. Other Volcanic Landforms
6. Intrusive Igneous Activity

7. Origin of Magma
8. Plate Tectonics and Igneous Activity

J. Mountain Building
1. Rock Deformation
2. Folds
3. Faults
4. Joints
5. Mountain Building
6. Mountain Building at Subduction Zones
7. Collisional Mountain Ranges
8. Fault-Block Mountains
9. Vertical Movements of the Crust

K. Geologic Time
1. Geology Needs a Time Scale
2. A Brief History of Geology
3. Relative Dating–Key Principles
4. Correlation of Rock Layers
5. Fossils: Evidence of Past Life
6. Dating with Radioactivity
7. The Geologic Time Scale
8. Difficulties in Dating the Geologic Time Scale

L. Earth's History: A Brief Summary
1. Precambrian Time: Vast and Enigmatic
2. Paleozoic Era: Life Explodes
3. Mesozoic Era: Age of the Dinosaurs
4. Cenozoic Era: Age of Mammals
5. Quaternary Epoch: Ice Ages and the Time of Now

M. The Atmosphere: Composition, Structure, and Temperature
1. Composition of the Atmosphere
2. Height and Structure of the Atmosphere
3. Earth—Sun Relationships
4. Energy, Heat and Temperature
5. Mechanisms of Heat Transfer
6. The Fate of Incoming Solar Radiation
7. Heating the Atmosphere: The Greenhouse Effect
8. For the Record: Air Temperature Data
9. Why Temperatures Vary: The Controls of Temperature
10. World Distribution of Temperature

N. Moisture, Clouds, and Precipitation
1. Water's Changes of State
2. Humidity: Water Vapor in the Atmosphere
3. The Basis of Cloud Formation: Adiabatic Cooling
4. Processes that Lift Air
5. The Weather maker: Atmospheric Stability
6. Condensation and Cloud Formation
7. Fog
8. How Precipitation Forms
9. Coalescence Process
10. Forms of Precipitation
11. Measuring Precipitation

O. Air Pressure and Wind
1. Understanding Air Pressure
2. Measuring Air Pressure
3. Factors Affecting Wind
4. Highs and Lows
5. General Circulation of the Atmosphere
6. The Westerlies
7. Local Winds
8. How Wind Is Measured
9. El Nino and La Nina
10. Global Distribution of Precipitation

P. Weather Patterns and Severe Storms
1. Air Masses
2. Fronts
3. The Middle-Latitude Cyclone
4. Thunderstorms

5. Tornadoes
6. Hurricanes

Q. Climate

1. The Climate System
2. World Climates
3. Climate Classification
4. Humid Tropical Climates
5. Dry Climates
6. Humid Middle-Latitude Climates with Mild Winters
7. Humid Middle-Latitude Climates with Severe Winters
8. Polar Climates
9. Highland Climates
10. Human Impact on Global Climate
11. Carbon Dioxide, Trace Gases, and Global Warming
12. Climate-Feedback Mechanisms
13. How Aerosols Influence Climate
14. Some Possible Consequences of Global Warming

Lab Outline

Laboratory Experiments
1. Performance of Field Technique Experiments
2. Performance of Experiments that reinforce and enhance Lecture topics
Examples:

In one activity, students identify rock and mineral samples based on their measurable characteristics.

In another activity, students determine location and distances on Earth using a topographic map, protractor, ruler, compass, and calculator.

In another activity, students determine the epicenters and magnitudes of earthquakes using seismograph data.

In another activity, students construct weather maps in order to forecast the weather for various cities.

Delivery Methods and Distance Education

Delivery Method: Please list all that apply -Face to face -Online (purely online no face-to-face contact) -Online with some required face-to-face meetings ("Hybrid") -Online course with on ground testing -iTV – Interactive video = Face to face course with significant required activities in a distance modality -Other

face to face
online

Rigor Statement: Assignments and evaluations should be of the same rigor as those used in the on-ground course. If they are not the same as those noted in the COR on the Methods of Evaluation and out-of-class assignments pages, indicate what the differences are and why they are being used. For instance, if labs, field trips, or site visits are required in the face to face section of this course, how will these requirements be met with the same rigor in the Distance Education section?

For the online version of PHSC C105, all lectures, homework assignments, and lab activities will consist of the same materials that are used in the face-to-face version of the course.

Lectures will be provided as online video lectures, PowerPoint files, and PDFs.

Homeworks will be provided as online quizzes that consist of multiple choice questions, essay questions, short answer questions, and diagram reading questions.

Exams will be provided as time limited online assignments that require proctors. These exams will consist of multiple choice questions, essay questions, short answer questions, and diagram reading questions.

Lab assignments will use the same lab manual activities that are used in the face-to-face version of the course. Lab assignments will also be supplemented with Google Map based investigations of Earth's surface features.

Effective Student-Instructor Contact: Good practice requires both asynchronous and synchronous contact for effective contact. List the methods expected of all instructors teaching the course. -Learning Management System -Discussion Forums -Moodle Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV -Interactive Video -Other (specify)

discussion forums
LMS message
chat/instant messaging
email
newsgroup/discussion board
proctored exam
telephone

Software and Equipment: What additional software or hardware, if any, is required for this course purely because of its delivery mode? How is technical support to be provided?

No Value

Accessibility: Section 508 of the Rehabilitation Act requires access to the Federal government's electronic and information technology. The law covers all types of electronic and information technology in the Federal sector and is not limited to assistive technologies used by people with disabilities. It applies to all Federal agencies when they develop, procure, maintain, or use such technology. Federal agencies must ensure that this technology is accessible to employees and the public to the extent it does not pose an "undue burden". I am using -iTV—Interactive Video only -Learning management system -Publisher course with learning management system interface.

LMS

Class Size: Good practice is that section size should be no greater in distance ed modes than in regular face-to-face versions of the course. Will the recommended section size be lower than in on-ground sections? If so, explain why.

No Value