COURSE OUTLINE : GEOL 105
D Credit – Degree Applicable
COURSE ID 004026
Cyclical Review: November 2019

COURSE DISCIPLINE : GEOL

COURSE NUMBER : 105

COURSE TITLE (FULL) : Earth and Life through Time

COURSE TITLE (SHORT) : Earth and Life through Time

CALIFORNIA STATE UNIVERSITY SYSTEM C-ID : GEOL 110 – Historical Geology

CATALOG DESCRIPTION

GEOL 105 is an introduction to Earth's history and the life it supports. Subjects include geologic dating, plate tectonics, stratigraphy, fossils, biological evolution, the planet's origin and the processes that have influenced paleogeography during the past 4.6 billion years.

Total Lecture Units: 3.00

Total Laboratory Units: 0.00

Total Course Units: 3.00

Total Lecture Hours: 54.00

Total Laboratory Hours: 0.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 54.00

Total Out-of-Class Hours: 108.00

Recommended Preparation: GEOL 101 or equivalent, ENGL 100 or ENGL 191, or ESL 141 or equivalent.

ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	GEOL	101	Physical Geology	explain the paradigm of uniformitarianism in the context of a scientific view of Earth's history;	Yes
2	GEOL	101	Physical Geology	implement basic skills to interpret timing relationships between rock units;	Yes
3	GEOL	101	Physical Geology	explain the rock cycle and describe the classification of rocks in some detail;	Yes
4	GEOL	101	Physical Geology	describe processes that shape the Earth's surface	Yes
5	ENGL	100	Writing Workshop	Read, analyze, and evaluate contemporary articles and stories to identify topic, thesis, support, transitions, conclusion, audience, and tone;	Yes
6	ENGL	191	* Writing Workshop II	organize and write an essay which addresses the topic and is directed by a thesis statement;	Yes
7	ESL	141	Grammar And Writing IV	comprehend multi-paragraph reading passages in textbooks.	Yes

EXIT STANDARDS

1 explain the scientific method;

2 explain the formation and basic properties of fossils, minerals and rocks;

3 describe concepts related to the fossil record including index fossils, bias in the fossil record, cladistics and collection methods;

4 describe ecological systems, biological evolution, and extinction concepts;

5 clearly draw and explain concepts related to plate tectonics, including clear understanding of the observations and evidence that led to the construction of plate tectonic theory;

6 explain the supercontinent cycle;

7 understand the basis for determinations of paleoclimatic conditions and show knowledge of broad climatic trends over time on Earth;

8 explain principles underlying radiometric dating of geological samples;

9 explain and use the principles underlying other methods for dating geological samples including magnetostratigraphy and biostratigraphy;

10 use the Geologic Time Scale and understand its basis;

11 interpret sequences of geologic events from cross sections, maps, or stratigraphic sequences using dating principles and understanding of how rocks form;

12 communicate complex course concepts effectively in writing and diagrams.

STUDENT LEARNING OUTCOMES

1 explain the scientific method
2 use the Geologic Time Scale and understand its basis
3 interpret sequences of geologic events from cross sections, maps, or stratigraphic sequences using dating principles and understanding of how rocks form
4 communicate complex course concepts effectively in writing and diagrams
5 explain the formation and basic properties of fossils, minerals and rocks
6 demonstrate understanding of concepts related to the fossil record including index fossils, bias in the fossil record, cladistics and collection methods
7 articulate understanding of ecological systems, biological evolution, and extinction concepts
8 clearly draw and explain concepts related to plate tectonics, including clear understanding of the observations and evidence that led to the construction of plate tectonic theory
9 explain the supercontinent cycle
10 understand the basis for determinations of paleoclimatic conditions and show knowledge of broad climatic trends over time on Earth
11 explain principles underlying radiometric dating of geological samples;
12 explain and use the principles underlying other methods for dating geological samples including magnetostratigraphy and biostratigraphy

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	Earth's Materials • Rock-forming minerals • Igneous, sedimentary and metamorphic rocks • Rock cycle	6	0	6
2	Earth Structures • Internal layers and their properties • Faults, folds, joints and other geologic structures and their formation • Geologic subdivisions of continents including shield, craton, orogenic provinces, rifts, volcanic arcs and terranes • Important landscape features including basic types of volcanoes and their correlation to their tectonic or geographic setting	6	0	6

3	Plate Tectonics • Driving mechanisms • Plate boundaries types and relationships to geologic structures and landscape • Observational basis for plate tectonic theory • Hot spots • Crustal evolution and deformation including continental growth and seafloor recycling • Supercontinent cycle	6	0	6
4	Fossils • Modes of formation • Classification • Bias in the fossil record Geology • Collection methods • Ecological principles • Biological evolution and evidence from the fossil record • Extinction concepts including background and mass extinction	8	0	8
5	Dating Methods • Principle of uniformitarianism in contrast to catastrophism • Geologic Time Scale • Relative dating using stratigraphic principles • Biostratigraphic and magnetostratigraphic principles • Radiometric dating	8	0	8

6	Stratigraphy • Basic principles of stratigraphy including unconformities, intrusive contacts and fault contacts • Sedimentary structures including bedding, crossbedding, graded bedding, mudcracks and raindrop impressions • Interpretation of sedimentary rock sequences using lithofacies and biofacies concepts • Transgressions and regressions of sea level	7	0	7
7	Paleogeography • Hadean events including origin and formation of Earth • Archean, Proterozoic and Ediacaran geologic and tectonic events • Paleozoic geologic and tectonic events • Mesozoic geologic and tectonic events • Cenozoic geologic and tectonic events • Recent geologic and tectonic events	9	0	9
8	Energy and Resources • Importance of geologic history in natural resource distribution • Man, the future and natural resources • Impact of civilization on geologic processes	4	0	4
				54

OUT OF CLASS ASSIGNMENTS

1 creation and analysis of graphs, figures, and data sets;
2 online assignments;
3 field trip reports (e.g., students write a geologic history of the Santa Monica Mountains);
4 individual or group projects that create reports or other media (e.g., students create a presentation or webpage on the Quaternary paleoclimate of the Los Angeles basin).

METHODS OF EVALUATION

1 instructor evaluation of attendance, participation in class, and participation in group work of any kind;
2 evaluation of student work by peers;
3 creation and analysis of graphs, figures, and data sets;
4 quizzes
5 tests, with at least one midterm exam and one final exam—exams including essay style or short answer questions are strongly encouraged;
6 instructor evaluation of student-created reports or other media.

METHODS OF INSTRUCTION

- [x] Lecture
- [ ] Laboratory
- [ ] Studio
- [x] Discussion
- [x] Multimedia
- [ ] Tutorial
- [ ] Independent Study
- [x] Collaboratory Learning
- [x] Demonstration
- [x] Field Activities (Trips)
- [ ] Guest Speakers
- [x] Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	IBSN	Date
Earth System History	Required	Macmillan Education	4	print	Stanley, Steven M	9781429255264	2015
The Earth through Time	Required	Wiley	10	print	Levin, Harold L	9781118254677	2013