

**CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS**

**NEW COURSE PROPOSAL**

PROGRAM AREA LIBERAL STUDIES

**1. Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of \_\_\_ units); time distribution (Lecture \_\_\_ hours, laboratory \_\_\_ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

**GEOL 300. FOUNDATIONS OF EARTH SCIENCE (4)**

Three hours of lecture and three hours of laboratory per week.

Prerequisite: CHEM/PHYS 170.

Principles of geology, hydrology, oceanography, meteorology, and astronomy for the elementary school teacher.

Lab fee required.

**2. Mode of Instruction.**

	<b>Units</b>	<b>Hours per Unit</b>	<b>Benchmark Enrollment</b>
Lecture	3	1	_____
Seminar	_____	_____	_____
Laboratory	1	3	_____
Activity	_____	_____	_____

**3. Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

The California Commission on Teacher Credentialing requires (2001) candidates for Multiple Subject Teaching Credentials in Domain 3 science (Earth and Space Science) to have a knowledge of astronomy, geology, meteorology, and oceanography. This course is designed to fulfill those requirements by introducing the students to the principles and practical aspects of each science through lecture and laboratory exercises. One purpose for the latter will be to develop exercises that the teachers can implement in their own classes.

Students who successfully complete this course will be able to:

- Explain basic principles in Geology including minerals, rocks, the Earth’s internal structure, plate tectonics, surface geological processes, the formation of land features, geological time and historical geology, and hydrology.
- Explain the principles and concepts behind atmospheric science, climate and meteorology including the evolution and structure of the atmosphere, solar radiation and the seasons, atmospheric circulation, climate and climatic change, and meteorology.
- Explain the basic principles in oceanography including the physical structure and chemical composition of the oceans, oceanic circulation, tides, and ocean features.
- Explain the principles and concepts behind astronomy including the formation of the universe, galaxies and their formation, stars and their formation/ death, our solar system, the Earth’s rotation and seasons, comets and asteroids.

**4. Is this a General Education Course** **NO**

**If Yes, indicate GE category:**

<b>A (English Language, Communication, Critical Thinking)</b>	
<b>B (Mathematics &amp; Sciences)</b>	
<b>C (Fine Arts, Literature, Languages &amp; Cultures)</b>	
<b>D (Social Perspectives)</b>	
<b>E (Human Psychological and Physiological Perspectives)</b>	

**5. Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*

*Geology*

Composition of the Earth

Minerals: their properties and formation

Rocks

Igneous rocks: their characteristics, crystallization from magma, intrusive igneous processes, and volcanism

Sedimentary rocks: their characteristics, weathering, erosion, sedimentation, and lithification

Metamorphic rocks: their characteristics, regional and contact metamorphism

Earth's internal structure

Earthquakes and seismic waves

Characteristics of the core, mantle, and crust

Structural geology and plate tectonics

Folds, faults, and other deformation

Plate tectonics

Mountain-building

Surface geological processes

Landslides

Streams and lakes

Deserts

Glaciers

Beaches, deltas, and other coastal features and their formative processes (especially waves and tides)

Coral reefs and carbonate platforms

Hydrology

The hydrologic cycle

Groundwater hydrology

Geological time

The geologic time scale

Relative and absolute dating

Historical geology

Major plate tectonic and mountain-building events through geologic time

Major developments in the history of life on Earth, including mass extinctions

*Atmospheric science, climate, and meteorology*

Evolution of the atmosphere

Structure of the atmosphere

Solar radiation and the seasons

Atmospheric circulation and its driving forces

Climate and climatic change, including El Niño and global warming

Meteorology

Atmospheric stability

Clouds and cloud formation

Air masses, fronts, storms, and precipitation

Thunderstorms, tornadoes, and hurricanes/typhoons

*Oceanography*

Physical structure of the oceans

Chemical composition of the oceans

Oceanic circulation

Tides and their causes

Continental shelves and slopes and the deep ocean

*Astronomy*

Formation of the universe

Galaxies

Formation and interactions of galaxies

Galaxies visible from Earth

Stars

Types of stars

Formation and death of stars

The major stars and constellations as seen from Earth

Formation of the solar system

The nine planets: their structure, orbital and rotational motions, and proposed causes

Earth's orbit and rotation and their impact on seasons  
Comets and asteroids: their structure, motions, and proposed causes

**6. References.** *[Provide 3 - 5 references on which this course is based and/or support it.]*

Lutgens, Frederick K. and Edward J. Tarbuck. Foundations of Earth Science (3<sup>rd</sup> edition). Prentice-Hall, 2001  
Hewitt, Paul G., John Suchocki, and Leslie A. Hewitt. Conceptual Physical Science (2<sup>nd</sup> edition). Addison Wesley Longman, 1999.

Other references:

Press, Frank and Raymond Siever. Understanding Earth (3<sup>rd</sup> edition). W.H. Freeman and Company, 2001.

Prothero, Donald R. and Robert H. Dott. Evolution of the Earth (6<sup>th</sup> edition). McGraw-Hill, 2002.

Lutgens, Frederick K. and Edward J. Tarbuck. The Atmosphere: An Introduction to Meteorology. Prentice-Hall, 2001.

Thurman, Harold V. and Alan P. Trujillo. Essentials of Oceanography (7<sup>th</sup> edition). Prentice Hall, 2001.

Fraknoi, Morrison, and Wolff. Voyages to the Planets (2<sup>nd</sup> edition). Harcourt, 1999.

Fraknoi, Morrison, and Wolff. Voyages to the Stars and Galaxies (2<sup>nd</sup> edition). Harcourt, 1999.

**7. List Faculty Qualified to Teach This Course.**

Faculty

**8. Frequency.**

a. Projected semesters to be offered: Fall   X   Spring   X   Summer       

**9. New Resources Required.**

- a. Computer (data processing), audio visual, broadcasting needs, other equipment
- b. Library needs
- c. Facility/space needs

**10. Consultation.**

Attach consultation sheet from all program areas, Library, and others (if necessary)

**11.** If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

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Proposer of Course

Date