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.**

<table>
<thead>
<tr>
<th>Hours per Benchmark</th>
<th>Units</th>
<th>Hours per Unit</th>
<th>Benchmark Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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:

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

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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.*

Other references:

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.

___________________________________________________
Proposer of Course    Date

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