Course Change Proposal
Form A

<table>
<thead>
<tr>
<th>Academic Group (College):</th>
<th>Academic Organization (Department):</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Sciences and Mathematics</td>
<td>Geology</td>
<td>Sept. 19, 2007</td>
</tr>
<tr>
<td>Type of Course Proposal:</td>
<td>Department Chair:</td>
<td>Submitted by:</td>
</tr>
<tr>
<td>New ___ Change ___ Deletion ___</td>
<td>David Evans</td>
<td>Judi Kusnick</td>
</tr>
</tbody>
</table>

Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes ___ No ___

For Catalog Copy: Yes ___ No ___
CCE (Extension): Yes ___ No ___

Semester Effective: Fall ___ Spring ___, 2008 ___

This course replaces experimental course Subject Area (prefix) and Catalog Nbr (course number):

<table>
<thead>
<tr>
<th>Subject Area (prefix) &amp; Catalog Nbr (course no.):</th>
<th>Title:</th>
<th>Units:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Subject Area (prefix) &amp; Catalog Nbr (course no.):</th>
<th>Title:</th>
<th>Units:</th>
</tr>
</thead>
</table>

JUSTIFICATION:

This course supports the new Earth Science major. It condenses the subject matter of two courses taken by Geology majors, Mineralogy (Geology 100) and Igneous/Metamorphic Petrology (Geology 102) into a single course more appropriate for the broader scope of the Earth Science major.

NEW COURSE DESCRIPTION: (Not to exceed 80 words, and language should conform to catalog copy. See http://www.csus.edu/aca/unicompendious/index.htm - Guidelines for Catalog Course Description)

Geology 17 Earth Materials Properties and identification of minerals and rocks; rock formation and the rock cycle. Field trip. Lecture three hours; laboratory three hours. Fee course.

Note:

Prerequisite: GEOL 5, GEOL 7, GEOL 8, or GEOL 10; GEOL 8L OR GEOL 10L (may be taken concurrently).

Enforced at Registration: Yes ___ No ___

Corequisite: Enforced at Registration: Yes ___ No ___

CAN (California Articulation Number):

Graded: Letter ___X___ Credit/No Credit ___ Instructor Approval Required? Yes ___ No ___

Course Classification (e.g., lecture, lab, seminar, discussion): Title for CMS (not more than 30 characters)
C-2, C-16 Earth Materials

Cross Listed? Yes ___ No ___X___ If yes, do they meet together and fulfill the same requirement, and what is the other course.

How Many Times Can This Course be Taken for Credit? ___1___

Can the course be taken for Credit more than once during the same term? Yes ___ No ___X___
FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

Description of the Expected Learning Outcomes: Describe outcomes using the following format: “Students will be able to: 1), 2), etc.” See the example at http://www.csus.edu/acaf/example.htm

Students will be able to:
1) identify common rock-forming minerals and economically important minerals using their properties
2) associate families of minerals by chemical composition
3) identify minerals by how they form (i.e., minerals formed by igneous processes, sedimentary processes, metamorphic processes
4) identify a representative group of rocks from each of the major rock types (igneous, sedimentary, metamorphic)
5) interpret the environment of formation for different rock types
6) associate rock types with the plate tectonic and environmental setting in which they form

**Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

Examinations:
Lab exams on identification of rocks and minerals
Written exams on mineral and rock interpretation

Assignments:
Lab assignments
Group activities
Student paper on formation and occurrence of a specific rock

For whom is this course being developed?
Majors in the Dept. X  Majors of other Depts ___  Minors in the Dept ___  General Education ___  Other ___
Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes X  No ___
If yes, identify program(s): Earth Science B.A.

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes ___  No X ___
If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any).

The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.

Approvals: If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

Signatures:  Date
Department Chair:  9/19/07
College Dean or Associate Dean:  9/20/07
CPSP (for school personnel courses ONLY)
Associate Vice President and Dean for Academic Programs

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean’s office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent.
No new resources required:

Geology 17 will be taught once each year, increasing faculty demand by 5WTU. This increase will be accommodated by a reduction in the number of Liberal Studies courses (Geology 8 on-line, Geology 8T) due to falling Liberal Studies demand.
Geology 17: Earth Materials

Catalog description: Geology 17 Earth Materials Properties and identification of minerals and rocks; rock formation and the rock cycle. Lecture three hours; laboratory three hours.

Prerequisite: Geology 5, 7, 8 or 10; and Geology 8L or 10L (can be taken concurrently)

Learning Objectives:
Students will be able to:
1) identify common rock-forming minerals and economically important minerals using their properties
2) associate families of minerals by chemical composition
3) identify minerals by how they form (i.e., minerals formed by igneous processes, sedimentary processes, metamorphic processes
4) identify a representative group of rocks from each of the major rock types (igneous, sedimentary, metamorphic)
5) interpret the environment of formation for different rock types
6) associate rock types with the plate tectonic and environmental setting in which they form

Format:
Lecture (three hours): The lectures will incorporate actual lecture, class discussion, and group work.
Lab (three hours): in each lab, you will be assigned a set of minerals and/or rocks to work with. You will complete a lab assignment each week. You will also learn to identify each set of minerals and/or rocks, to be tested in lab exams
Field trip: The date of the mandatory field trip is not yet arranged. There will be a $10 course fee to cover the cost of transportation.

Required texts: Mineralogy, 2nd Ed., by Dexter Perkins; and Petrology, the Study of Igneous, Sedimentary and Metamorphic Rocks by Loren Raymond.

Required Work: Your grade will be based on two lecture exams, two lab exams, assignments and one project.

Assignments:
Each week you will complete a lab assignment, due at the end of lab. You will also be given homework assignments and group activities to be done during the lecture period.

Project: You will be assigned one mineral or rock to research. You will report the results of your research both in a four-page paper, and in an oral report. You will receive handout with more details of the project later in the semester.
Grade Breakdown:
Assignments: 25%
Lecture exams: 30%
Lab exams: 30%
Project: 15%

**Course Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physical properties of minerals</td>
</tr>
<tr>
<td>2</td>
<td>Chemical and crystal properties of minerals</td>
</tr>
<tr>
<td>3</td>
<td>Common rock-forming minerals</td>
</tr>
<tr>
<td>4</td>
<td>Common rock-forming minerals</td>
</tr>
<tr>
<td>5</td>
<td>Lecture Exam I, Overview of rocks</td>
</tr>
<tr>
<td>6</td>
<td>Igneous minerals, rocks and processes</td>
</tr>
<tr>
<td>7</td>
<td>Igneous minerals, rocks and processes</td>
</tr>
<tr>
<td>8</td>
<td>Sedimentary minerals, rocks and processes, Lab Exam I</td>
</tr>
<tr>
<td>9</td>
<td>Sedimentary minerals, rocks and processes</td>
</tr>
<tr>
<td>10</td>
<td>Metamorphic rocks and processes</td>
</tr>
<tr>
<td>11</td>
<td>Metamorphic rocks and processes</td>
</tr>
<tr>
<td>12</td>
<td>Rock cycle and plate tectonics</td>
</tr>
<tr>
<td>13</td>
<td>Formation of ores</td>
</tr>
<tr>
<td>14</td>
<td>Lecture Exam II, Lab Exam II</td>
</tr>
<tr>
<td>15</td>
<td>Presentation of Projects</td>
</tr>
</tbody>
</table>