

**CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA  
ACADEMIC SENATE**

DATE: January 13, 2010  
TO: Academic Programs Committee  
FROM: Academic Senate Executive Committee  
SUBJECT: Academic Senate Referral

1. CLASSIFICATION: AP-006-910
2. TITLE OF REFERRAL: **Combination of Geology and Integrated Earth Studies degree programs into one degree program named "Geology"**
3. BACKGROUND: See attached referral request form. Additional background provided by the EC: None
4. RECOMMENDED RESOURCES: See attached referral request form and supporting documentation. Additional resources recommended by the EC: All Faculty in the College of Science

For the Committee's Report on this referral, please list only the resources that were actually consulted.

5. REVIEW AND RECOMMEND: Review and recommend as appropriate.
6. DATE REQUIRED FOR PRESENTING COMMITTEE REPORT TO EXECUTIVE COMMITTEE: **February 3, 2010**

**CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA  
ACADEMIC SENATE  
REFERRAL REQUEST FORM**

Please provide all information requested in this form. Incomplete referrals will be returned. Referrals must be submitted in electronic form to:  
**senate@csupomona.edu**

**Date: 1/12/10**

**Names and titles of proponents:**

**Jonathan Nourse, Professor and Chair, Geological Sciences Department**

<p><b>KEYWORDS:</b> (list at least 3 keywords to facilitate referral access through database) <b>Geological Sciences, Combination, Emphasis Areas, Geology, Geophysics, Earth Exploration, Environmental Resources</b></p>
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**TITLE OF REFERRAL: Combination of Geology and Integrated Earth Studies degree programs into one degree program named "Geology"**

**BACKGROUND: Last winter (February, 2009) the Geological Sciences Department submitted two parallel proposals to reorganize its existing Geology and Integrated Earth Studies degree programs into multiple emphasis areas. Following academic program review and meetings with the Provost during fall, 2009, a new plan has been developed to combine the two degree programs into one. This new proposal (presented here) supersedes the two original proposals. No additional academic resources are required; in fact, this plan will save costs in terms of streamlining the Geology Department's curriculum and maximizing efficiency of its faculty.**

**The Geology Department proposes to combine the Geology and Integrated Earth Studies degree programs into one degree program named "Geology." Key courses from both original degree programs will be retained in the Required Core. Remaining courses will be divided into three separate emphasis areas or "tracks" named "Geology", "Geophysics/Earth Exploration" and "Environmental Resources." (see attachments) The Geology track is unchanged from the existing Geology degree other than shifting of some courses from Required Core to Restricted Elective. The Geophysics/Earth Exploration track provides a curriculum to better accommodate the growing number of students who are obtaining jobs in the geotechnical industry. This track also strengthens an ongoing interdisciplinary collaboration with the Department of Civil Engineering. The Environmental Resources track incorporates important core classes from the original Integrated Earth Studies degree program and includes a**

**breadth of courses from other departments to address the needs of students interested in solving environmental problems.**

**RECOMMENDED RESOURCES: Jonathan Nourse**

The Executive Committee (EC) forwards the referrals to a standing committee that researches the proposal, contacts resources, and submits a report. The EC reviews the report, forwards it to the Senate or returns it to the standing committee for additional information, clarification, or review. After the EC accepts the report it is placed on the agenda of the next Academic Senate meeting for a first reading and a month later for a second reading where voting takes place. The referral is then sent to the President for approval. **Depending on the topic the process may take from 1 to 3 quarters.** A motion to waive the first reading, if approved by the Senate, would reduce the wait time by one month.

Is there a deadline by when this referral needs to be considered by the Academic Senate?    No   X   Yes, by **Ideally, put it through Academic Programs Committee for first Senate reading on February 10, 2010**

Justification for deadline:

**This proposal is a simple merger of the two parallel proposals reviewed by Academic Programs Committee during fall of 2009. Paper consultations were completed a year ago for all courses involved with this proposal. This is an example of what a small Department could do in the face of the crises and impending cuts. There is an opportunity to showcase this curriculum merger as an example for other programs that may be considering similar cost-saving measures. Geology wishes to begin implementing this curriculum fall quarter, 2010.**

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CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

**SUMMARY OF PROPOSED CURRICULUM CHANGES**

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**Department: Geological Sciences**

**Date: January 11, 2010**

**Degree Program: Geology**

- Academic Master Plan Proposals
- American Cultural Perspectives Proposals
- General Education Proposals

**X Miscellaneous Proposals— Combine Geology and Integrated Earth Studies degree programs into one degree program named "Geology"**

(Use separate forms for each of these options)

**I. Curricular Proposals (*Consultation Required*): *Paper consultations were completed prior to February 10, 2009. See attached curriculum summary sheet showing before and after appearance of the two existing degrees versus the combined degree program***

**A. Courses to be Added**

**Intro to Global Geophysics GSC 307/L**—new required core course

- Knowledge of the fundamentals of the physics of the Earth is important for students in the Earth Sciences

**Quant. Appl. in Earth Science GSC 225**— allow course as optional substitution for MAT 116

- Course applies mathematical techniques to problems specific to the Earth Sciences and thus offers a more directly practical quantitative capstone course content for students interested in pursuing a career in industry after obtaining their degree
- Students applying for graduate school will be strongly encouraged to complete MAT 116

**Writing for the Professions ENG 301**—optional substitution for GSC 463

- Course provides training in technical report writing and reference citation styles similar to methods used in scientific journal publications and the writing of thesis documents

**Report Writing COM 216**—optional substitution for GSC 463

- Course provides training in technical report writing and reference citation styles similar to methods used in scientific journal publications and the writing of thesis documents

**Technical Communication/Documentation CE 362/A**—optional substitution for GSC 463

- Course provides training in technical report writing and reference citation styles similar to methods used in scientific journal publications and the writing of thesis documents

**Fortran CS 125**—add as restricted elective for Geophysics/Earth Exploration track (either/or with CS 128; CS 140)

- Basic knowledge of computers and programming is indispensable for students interested in pursuing a career in Geophysics

**Intro to C++ CS 128**—add as restricted elective for Geophysics/Earth Exploration track (either/or with CS 125; CS 140)

- Basic knowledge of computers and programming is indispensable for students interested in pursuing a career in Geophysics

**Intro to Computer Science CS 140**—add as restricted elective for Geophysics/Earth Exploration track (either/or with CS 125; CS 128)

- Basic knowledge of computers and programming is indispensable for students interested in pursuing a career in Geophysics

**Ethical Considerations in Engineering and Applied Science EGR 402**—add as restricted elective for Environmental Resources track

- Course provides insight into ethical issues in science and engineering that may be encountered in geotechnical fields

**Environmental Resource Management CE 351/L**—add as restricted elective for Environmental Resources track

**Climatology GEO 303**—add as restricted elective in Environment Resources track

**Environment and Society BIO 304**—add as restricted elective in Environment Resources track

**College Physics and College Physics Lab PHY121/L**—add as required support course (either/or with existing PHY 131/L requirement)

**College Physics and College Physics Lab PHY122/L**—add as required support course (either/or with existing PHY 132/L requirement)

**College Physics and College Physics Lab PHY123/L**—add as required support course (either/or with existing PHY 133/L requirement)

**Current Applications in Regenerative Studies RS 414/L**- add as restricted elective in Environment Resources track

**Energy and Society PHY 301--** add as restricted elective in Environment Resources track

**Advanced GIS I GEO 442**— add as restricted elective in Environment Resources track

**California Water URP 482**—add as restricted elective in Environment Resources track

**Water Resource Management EC 439**—add as restricted elective in Environment Resources track

#### **B. Courses to be Deleted**

#### **C. Courses to be Modified**

**Intro to Global Geophysics GSC 307/L**—change of prerequisites to an Algebra subscore of 30-50 and Trig subscore of 5-10 in the PreCalculus MDPT or MAT112 or MAT106

- Prerequisites are modified to reflect the minor modification of the course material needed to make the quantitative elements of this course of a level suitable for a broader range of student backgrounds

#### **D. Other curricular changes that require consultation**

**GIS Applications for Earth and Environmental Scientists I or II (GSC 310/L or GSC 311/L)**—allow either of these courses as prerequisite for GEO 442

## **II. Internal Curricular Proposals (*Consultation Not Required—Justifications are stated below where appropriate*)**

#### **A. Courses to be Deleted**

**Megascopic Petrography GSC 145L**—delete from required core

#### **B. Courses to be Modified**

**Field Methods GSC 255/L--** remove GSC 145L (Mesoscopic Petrography) prerequisite; remove the 1 unit lecture requirement; reduce Laboratory units from 3 to 2; modify catalog description; change course number to GSC 255L

- The basic level of hand-specimen petrography (GSC 145L) needed for GSC 255 is now taught by the instructor in the field
- GSC 255 lecture is now incorporated into the laboratory exercises
- The course is no longer taught as a week-long field activity during Spring break. Laboratory units are reduced from 3 to 2, with laboratory exercises conducted in the field over 4 to 5 separate Saturdays and/or Sundays. Course classification number is C-16.

- New catalog description should read:  
Geologic Field Methods—GSC 255L: Methods of geological field investigation: basic techniques for recognizing, mapping, and interpreting geologic structures and Earth surface features, including stratigraphic section measurement, topographic map reading, and geological mapping with Brunton compass and GPS receiver. Saturday and/or Sunday field trips required. Field trip fee required. 2 units laboratory. Prerequisites: GSC 111 and GSC 141L

**Quant. Appl. in Earth Science GSC 225**—change prerequisites to MAT 106 or higher

- Prerequisites modified to reflect the minor modification of the course material needed to make the quantitative elements of this course of a level suitable for students with a broader range of backgrounds

**Structural Geology GSC 333/L**—remove GSC 255/L prerequisite

- Field techniques utilized in this course are taught by instructor so Field Methods course is unnecessary

**Exploration Geophysics GSC 334/L**—change name, course number and prerequisites

- Geophysical techniques covered by this class are currently more frequently applied in geotechnical and environmental industries, not just in oil and gas exploration. Therefore, **“Shallow Subsurface Geophysics”** is a more appropriate and descriptive name than “Exploration Geophysics”.
- Course content has been updated and is now appropriate for seniors and Masters students in Civil Engineering, thus proposed **course number change from GSC 334 to GSC 434**.
- Prerequisite change should **add GSC 307 “Global Geophysics”** which provides appropriate background for this class.

**Intro to Seismology GSC 450/L**— change of prerequisites to GSC 307 or PHY 307 or GSC 434 or MAT112

- Prerequisites are modified to reflect the minor modification of the course material needed to make the quantitative elements of this course of a level suitable for a broader range of student backgrounds

**Senior Project GSC 461**—change name; modify catalog description

- New catalog description should read:  
Senior Project—GSC 461: Independent research study into a geologic problem of scientific merit following standard scientific methodology. Topic selection, research techniques and data acquisition are conducted under close guidance and supervision of a GSC faculty research advisor.. 2 Units
- Course classification number remains unchanged (S-36)

**Senior Presentation GSC 462**-- change name; modify catalog description

- New catalog description should read:  
Senior Presentation—GSC 462: Analysis and interpretation of data acquired in GSC 461. Formal presentation of results via a poster at a professional conference or an oral presentation to peers and faculty. Carried out under supervision of a GSC faculty research advisor. 2 Units
- Course classification number remains unchanged (S-36)

**Senior Thesis GSC 463**—modify catalog description, change course classification number

- New catalog description should read:

Senior Thesis—GSC 463: Completion of a formal written senior thesis document, formatted to GSC Department specifications with appropriate scientific citation style. The thesis will be evaluated for clarity, organization, scientific merit and the author's ability to discuss alternative hypotheses. Carried out under supervision of a GSC faculty research advisor. 2 Units

- Change course classification number from C-5 to C-78)

**C. Other curricular changes that DO NOT require consultation**

**\*Create three separate Tracks (Emphasis Areas) named “Geology,”**

**“Geophysics/Earth Exploration” and “Environmental Resources”**

*\*This entails internal rearrangement of GSC curriculum as outlined below; also see attached spreadsheet for comparison to current Geology and IES degree programs*

**Optical Mineralogy GS 325/L**--shift from required core to restricted elective in the Geology track

**Invertebrate Paleontology GSC 331/L**--shift from required core to restricted elective in the Geology track

**Sedimentary Geology GSC 423/L**--shift from required core to restricted elective in the Geology track

**Igneous and Metamorphic Petrology GSC 424**--shift from required core to restricted elective in the Geology track

**Igneous and Metamorphic Petrology Lab GSC 425L**--shift from required core to restricted elective  
In the Geology track

**Ore Deposits GSC 433/L**--shift from required core to restricted elective in the Geology track

**Geotectonics GSC 444/L**--shift from required core to restricted elective in the Geology track

**Field Module GSC 491L**— Shift 8 units from required core to restricted elective in the Geology track.

**Intro to Astronomy GSC 116**--add as restricted elective in Geophysics/Earth Exploration track (either/or with GSC120; GSC195)

- Basic knowledge of our solar system is useful in the study of the physics of our own planet

**Intro to Oceanography GSC 120**--add as restricted elective in Geophysics/Earth Exploration track (either/or with GSC116; 195)

- Basic understanding of our oceans is useful in the study of the physics of Earth

**Living in Earthquake Country GSC 195** —add as restricted elective for Geophysics/Earth Exploration and Environmental Resources tracks

- Basic understanding of earthquakes in southern California is important in the study of the physics of Earth, as well as hazard related studies in engineering geology

**Meteorology GSC 304**-- add as restricted elective in the Geophysics/Earth Exploration and Environmental Resources tracks

- Basic knowledge of our atmosphere and weather is useful in the study of the physics of our own planet

**Studies of Blue Planet GSC 320**-- add as restricted elective in the Geophysics/Earth Exploration and Environmental Resources tracks

- This course provides exposure to quantitative techniques of measuring the oceans and atmosphere useful for understanding environmental aspects of geophysics

**GIS Applications II GSC 311/L**--optional substitution for GSC 310/L in required core

- Both GSC 310 and GSC 311 as currently taught utilize the same computer programs (ArcGIS, Microsoft Excel, MapInfo, Adobe Photoshop, Adobe Illustrator). Specific problems and activities differ between the courses, but the techniques applicable to industry and graduate school are similar.

**Engineering Geology I GSC 321/L**--shift from required core to restricted elective in the Geophysics/Earth Exploration track

- Approximately one half of GSC 321/L is a review of GSC 111-GSC141L, therefore this course is removed from the required core for all Geology majors
- The first Engineering Geology course (GSC 321/L) provides additional exposure to geotechnical problems and extra contact and interaction with Civil Engineering majors that is appropriate for Geology students in the Engineering Geology track

**Earth Science Seminar GSC 410**—add this new course to required core

- The seminar course trains students in methods of organizing and presenting Earth science data in an oral seminar forum
- Through attendance and critique of others' seminars or talks, students reinforce their oral presentation experience and skills
- Course classification number is C-5

**Engineering Geology II GSC 415/L**—shift from required core to restricted elective in the Geophysics/Earth Exploration track

- Knowledge of hazards is important in the study of earthquakes and engineering geology

**Shallow Subsurface Geophysics GSC 434/L**—add as restricted elective in the Geophysics/Earth Exploration track

- Knowledge of techniques to determine subsurface structures is important in geophysics and engineering geology

**Intro to Seismology GSC 450/L**— add as restricted elective in the Geophysics/Earth Exploration track

- Knowledge of earthquakes and earthquake hazards is important in geophysics and engineering geology

**Field Module GSC 491L**— Add 2 units as restricted elective in both Geophysics/Earth Exploration and Environmental Resources tracks

- Addition of a 2 unit of geological field mapping class provides an extra field work component to both tracks

### **III. Other Changes**

(Describe and explain any proposed changes that involve academic policy rather than curricular matters.)

