To be adopted:

Proposed Changes to Geology Major Requirements

**PRESENT:**

**General Geology Option** (53 units)
1. GEO 100, GEO 116, GEO 118,
2. GEO 102A (1-9) units in one quarter), or GEO 102A and GEO 102B (9 units in two quarters), or GEO 102A, GEO 102B, and GEO 102C (maximum of 9 units in three quarters)
3. One course from GEO 157, GEO 160, GEO 161, GEO 162, GEO 169
4. One course from GEO 124, GEO 132, GEO 136, GEO 137
5. One course from GEO 140, GEO 144, GEO 145, GEO 147.
6. GEO 151 or GEO 152/BIOL 152
7. Eight (8) additional units of related upper-division courses approved by the undergraduate advisor

**PROPOSED:**

1. (No change.)
2. GEO 102A (8) units in one quarter), and GEO 102B (1) unit summer field camp.
3. (No change.)
4. (No change.)
5. (No change.)
6. (No change.)
7. (No change.)

**Geobiology Option** (53 units)
1. BIOL 005B, BIOL 005C
2. GEO 100, GEO 116, GEO 118,
3. GEO 102A (9 units in one quarter) of GEO 102A and GEO 102B (9 units in two quarters), or GEO 102A, GEO 102B, and GEO 102C (maximum of 9 units in three quarters)
4. Three courses from GEO 151, GEO 152/BIOL 152, GEO 160, GEO 169
5. Four (4) additional units of related upper-division courses approved by the undergraduate advisor

**PROPOSED:**

1. (No change.)
2. GEO 102A (8 units in one quarter) and GEO 102B (1 unit in summer field camp).
3. (No change.)
4. (No change)
5. (No change)

**JUSTIFICATION:**
This class, commonly referred to as “Summer Field” serves as a capstone experience for those Geology majors in the General Geology option, the Geobiology option, and the Geophysics option. herein we propose several changes, which are dealt with in sequence.
1. **Reduction from 14 to 9 units:** In recent years students have taken the class at one of a variety of external field camps run by other universities where the students undertake field mapping of sedimentary, igneous, and metamorphic rocks. A maximum credit of 14 units may be awarded for the class, but the units provided by the camps do not exceed 9 units. Accordingly, the undergraduate advisor routinely has to write letters “waiving, without reservation, the 5 unit short fall.” By reducing the maximum number of units to 9 this persistent and time consuming requirement will be avoided.

Field camp is a continuous and exacting “total immersion” experience for the students, who commonly work in the field all day followed by follow-up sessions extending into the evening. The decision to rate our own GEO 102 course at 14-units is decades old. It reflected a time when all mapping work was done in GEO 102 over a 6 week period, but now we have two classes earlier in the sequence, GEO 101 and GEO 115 that provide a strong background for taking GEO 102, and justify the overall unit reduction. Furthermore, estimating exactly how many units are justified is necessarily inexact: Students complete hundreds of hours of field work, rated like a lab at 3 hours per unit, plus the seminar-style evening sessions in which they are taught to draft professional maps and reports, which can be variously rated as 1 or 3 hours per unit depending whether the style on any given evening better resembles a lecture, discussion or lab. An alternative calculation considers that some of the field work is an outdoor lecture, with students doing follow-up; this leads to higher unit totals and ignores the presence of instructors at all hours of the course. For a “live-in” field course there may be no easy distinction between a discussion section and "group office hours" or between a lecture and a “working picnic lunch.” Colleges inevitably differ in their unit calculation for these courses. This change was first approved by Department of Earth Sciences on 3 November 2014.

2. **Change from the GEO 102 A-C (1-14 units) series to a GEO 102A (8 units), GEO 102B (1 unit) series.** The Committee on Courses voted, on 22 October 2015 to approve this change, with the Chair writing on 23 October “The Committee unanimously voted to recommend that the department adopt the 8-1 option listed in the proposal that would require students to enroll in GEO 102A for 8 units in the spring and enroll in GEO 102B for 1 unit in the summer. The Committee recommends that the department work to submit a course change proposal in CRAMS to change the units of GEO 102A and GEO 102B so that they account for this option and clearly state in the course proposals and syllabi that field work for the courses will be completed in the summer so that students are informed, especially when enrolling in the course for spring. A course proposal will also need to be submitted in CRAMS to delete GEO 102C.”

3. **Change of prerequisites:** With the proposed course changes to GEO 102A-B as a class that can now be tailored to the specific structure of the UCR program in geology rather than the “outsourced” classes students currently take, GEO 100 (Igneous & Metamorphic Petrology) will remain as a prerequisite. GEO 101 (Field Geology) should be added as a prerequisite as it will provide the necessary fundamental field geology skills needed for this advanced field course that will build on skills acquired. GEO 116 (Structural Geology) should be added as a prerequisite as it will provide the necessary background in earth deformation (e.g. faults, fractures, and folds) to allow the students to interpret some of the geologic structures they will see. GEO 118 (Sedimentology and Stratigraphy) will remain a prerequisite as it continues to provide the necessary background in sedimentary rocks to prepare students for the more complex field mapping this course will require.

4. **Addition of Course Material and Service Fee.** The change from an “outsourced” GEO 102A-C series to the newly proposed “in-house” GEO 102A-B requires the addition of a Course Material and Service Fee to cover significant field expenses. The appropriate meetings and communications have been conducted with the UCR Earth Sciences student body concerning this fee and it is presently in review at the Dean’s Office. The total cost of the course per student including UC fees and the Course Material Fee is on the order of $2200, a drastic reduction from the $4500-6800 (commercially driven) rate that our students must pay to attend an external institution’s field camp. This fee is necessary for this course to be sustainable.
APPROVALS:
Approved by the Department of Earth Sciences: November 10, 2015
Approved by the CNAS Executive Committee: January 5, 2016
Approved by the Committee on Educational Policy: April 27, 2016