

## SUMMARY OF IDENTIFIED TRENDS

Faculty from community colleges, CSU, and UC are in general satisfied with the current lower division requirements for the Geology/Earth Science degree. But they also acknowledge that their biggest challenge lies in convincing community colleges students of the need to complete these requirements prior to transfer. Most of the discussion amongst Earth Science faculty at the regional meetings centered on ways this could possibly be accomplished.

## SUMMARY OF IDENTIFIED ISSUES

1. Many community college geology majors transfer to four-year colleges and universities without having completed most—if any—of their math, physics, and chemistry requirements while attending the community college.
2. Students completing IGETC requirements at the community colleges often fail to complete the pre-calculus/calculus math and other science prerequisites for the Geology major offered at four-year schools.
3. Community college students' enthusiasm about Earth Sciences, kindled in classes such as Physical and Historical Geology, leads to these same students transferring out of community colleges "too" early (i.e., before completing their math and other science requirements).
4. Currently only Physical and Historical Geology have CAN numbers; however, a majority of community colleges offer more classes than this. Should other geology courses, such as Oceanography, Environmental Geology, and Mineralogy be given CAN status?
5. There needs to be improved communication amongst faculty in community colleges and four-year schools, especially regarding curricular changes and presenting information about transferring from a community college to a particular four-year program.

## COMMENTS FROM STATEWIDE MEETINGS AND THE GENERAL FIELD

Participants in meetings across the state expressed these concerns:

1. In an ideal world, math, physics, and chemistry courses would incorporate some geologic examples into their curriculum, e.g., in assigned problem sets. Since this is not likely to happen, Earth Sciences faculty should make a greater effort to incorporate math, chemistry, and physics into their own courses. This may be particularly important for courses in Physical and Historical Geology, as these are the only two geology courses that are considered lower division.
2. Earth Sciences faculty need to be even more vigilant in advising their potential transfer students to complete math, chemistry, and physics prerequisites required for major preparation at four-year schools, even at the expense of IGETC. Some attendees at all regional meetings suggested that high-unit major programs (like Earth Sciences) need a new program of study to replace IGETC as a community college graduation model (specifically a program that stresses completion of major preparation requirements in math, chemistry, and physics).
3. One way to try and keep Earth Science students at community college while completing their lower division major requirements would be to establish joint enrollment at four-year colleges and universities. This would allow these students, while in their final year at community college finishing their basic science requirements, to take more advanced geology courses at their local college/university. Many CSU campuses are in effect already doing this on a limited basis under their cross-enrollment policies.
4. Currently only Physical and Historical Geology have CAN descriptors; however, a majority of community colleges offer more classes than this. The attendees at the regional meetings debated whether other

geology courses, such as Oceanography, Environmental Geology, and Mineralogy might be given CAN status. The majority agreed that for cost and staffing reasons, it is unrealistic to expect that community colleges can teach a Mineralogy course (especially one with Optics) that would be (CAN) equivalent to that taught at a four-year institution. Most attendees also agreed that on paper, community college courses on Oceanography and Environmental Geology are very similar to those taught at four-year colleges. Yet at four-year colleges, these courses presently have upper-division status. While discussion about possible revision yielded some suggestions at the statewide meeting, this topic will be added to next year's agenda.

5. Geology departments at 4-year schools can and should do more outreach to community colleges. For example, they can design specific informational links for prospective community college transfer students (and their advisors) on departmental websites. (See an example of this at <http://www-geology.ucdavis.edu/www/studentinfo/transfer.html>). Community colleges should be specifically invited to attend departmental open houses, and community colleges instructors should consider bringing their students to these events. Field trips should be run jointly with faculty and students from community colleges and 4-year schools. This would have the added benefit of creating and maintaining interaction with faculty from a variety of schools. Finally, the possibility of forming a listserve or chat room about the issues addressed in this and other meetings should be examined.

### RECOMMENDATIONS TO THE DISCIPLINE

1. Identify strategies to urge students, in the strongest language possible, to complete prerequisites before transfer.
2. Earth Sciences faculty should make a greater effort to incorporate math, chemistry, and physics into their own courses, particularly in Physical and Historical Geology.
3. Establish joint enrollment at four-year schools for Geology students in their final year at a community

college, allowing them to take more advanced geology courses at their local university while finishing their basic science requirements at the community college. Many CSU campuses are already doing this with their cross-enrollment policies.

4. Geology departments at four-year schools can and should do more outreach to community colleges. Specific recommendations include:
  - ◆ designing specific informational links for prospective community college transfer students (and their advisors) on departmental websites.
  - ◆ invite community colleges to attend departmental open houses to which these instructors should consider bringing their students
  - ◆ run joint field trips with faculty and students from community colleges and four-year schools. This strategy would have the added benefit of creating and maintaining interaction with faculty from a variety of schools.
  - ◆ form a listserve or chat room where issues addressed in this and other meetings should be examined.

### RECOMMENDATIONS FOR SUPPORT COURSES

Join with other disciplines to consider what might comprise a science alternative to the IGETC model to serve Earth Sciences and other science-intensive majors.

### TOPICS FOR FURTHER DISCUSSION

1. Consider what might comprise a science alternative to the IGETC model to serve Earth Sciences and other science-intensive majors.
2. Consider establishing CAN descriptions for courses in Mineralogy, Oceanography, and Environmental Geology
3. Alternatively, consider a mechanism for waiving requirements for upper division courses that have already been taken at the lower division (e.g., Oceanography and Environmental Geology).