Skyline College

EARTH SCIENCE

Program Review Executive Summary

Short Summary of Findings

The Earth Science program at Skyline College is a valuable asset that serves an important constituency. A very large number of students benefit from physical science classes in Geology and Oceanography since most G.E. students choose an earth science class for their physical science requirement. Because of the close cooperation and careful planning of both of its instructors, earth science is a solid, self-sufficient operation with high internal efficiency and low external maintenance. For this reason it can be overlooked when it comes to requests for program needs.

Three Strengths of the Program

- The instructors each have over 30 years of experience in teaching and community service. Their innovative instructional techniques have garnered national notoriety as well as positive publicity for Skyline College.
- The program is extremely efficient with large numbers of students enrolled and retained.
- The delivery of information has kept pace with the new discoveries in science, and is presented in a manner that keeps pace with the changing student population.

Three Suggestions for Improvement

- Recognize earth science as an important part of the Science Division at Skyline by taking their needs into consideration in the redesign of the new science complex.
- Allocate the program a proportionate amount of equipment budget money, and storage/prep space.
- Appreciate the unique problems, challenges, and costs associated with classes that include off-campus field trips.

Full-Time Faculty Signatures

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Mel Zucker *Richard Lambert*

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SKYLINE COLLEGE
PROGRAM REVIEW SELF STUDY

PART A: Overview of Program

1. State the goals/ focus of this program and how the program contributes to the mission and priorities of the College and District.

The goals of the Earth Science program at Skyline College are consistent with the stated goals of the School. These goals include:

a. Provide a breadth of educational opportunities and experiences which encourage students to develop their general understanding of human effort and achievement.
    i. This is accomplished by providing a range of science classes that are approachable and understandable even by those with no mathematical background or scientific inclination.
    ii. The subjects of the earth sciences have demonstrably direct application to everyday life for most Californians.
b. Provide lower division programs to enable students to transfer to baccalaureate institutions.
    i. All of Skyline's earth science offerings are transferable to four-year institutions.
    ii. The classes can form the foundation for a major in the discipline.

2. Discuss how this program coordinates, impacts, and/or interacts with other programs in the College.

Courses in geology and oceanography compliment other programs at the college by providing an accessible approach to science, with topics that have application to every-day life. The instructors strive to connect earth science class material to other courses across Skyline's curriculum whenever possible by making reference to related disciplines in math, physics, chemistry, and biology. Even references to classic literature, foreign languages, and the fine arts find their way into these classes.

3. If the program utilizes advisory boards and/or professional organizations, describe their roles.

Although no formal advisory boards oversee the Earth Science program, the instructors are guided by professional relationships with organizations such as the National Association of Geoscience Teachers, the Geological Society of America, and the United States Geological Survey.

4. Explain how this program meets the needs of our diverse community.

Students from widely varied cultural and socioeconomic backgrounds thrive in earth sciences, where the subject matter itself is so diverse and international. In part it is because many of the concepts are typically not as abstract as in other sciences, but are quite visual, perceptible, and concrete. This factor is exploited with the extensive use of audio-visual media in the classroom. Topics are often taken from everyday experience, news reports, and other areas of common interest. It is also significant to note that much of the technical vocabulary used in geology and oceanography is appropriated from other languages. This fact is used to good advantage in the classroom. Many of these topics are issues of global significance that incorporate multi-cultural awareness.

5. If the program has completed a previous self-study, evaluate the progress made toward previous goals.

Previous program goals have focused on helping the division support and maintain a large, well-served student population. While earth science instructors have always stressed the quality of education, and continue to maintain high academic standards, they have also been willing to accept and sustain high enrollments. Furthermore, they have worked hard to produce very high rates of retention while trying to maintain a large selection of basic classes at a variety of scheduled times.

PART B: Curriculum

1. Describe how the courses offered in the program meet the needs of the discipline(s) and the students. (This may be answered through descriptive narrative evaluation or quantitative research).

The earth science curriculum offers a range of courses that include lecture, combined lecture-lab, and field classes. Courses cover a wide variety of topics within the subject area. The present curriculum can satisfy the needs of all students attending Skyline. Science majors can begin with U.C./C.S.U. transfer lecture-lab courses. Transfer students seeking general education requirements can also satisfy their lab or lecture science areas. Students seeking their A.A. degree have a wide choice of classes and scheduled times. The program’s commitment to the evening college and the diverse student population it serves remains evident by the continuous and coordinated participation of the daytime faculty in evening general education classes.

2. State how the program has remained current in the discipline(s).

The two members of the faculty in earth science work in close cooperation for the benefit of the program and their students. In addition to a regularly scheduled weekly department meeting, they meet frequently, often daily, to discuss common concerns, and collaborate in the development of materials for the classroom and the community. Regular meetings are also held with colleagues from San Francisco State University, and valuable professional relationships have been developed with members of the United States Geological Survey in Menlo Park. In addition, Skyline earth science instructors have participated in numerous local and national conferences and field trips where scientists and educators gather to share new ideas and methods. Examples include the field trips and meetings of the National Association of Geoscience Teachers, and the conferences of the American Association for the Advancement of Science. In a recent annual meeting of the Geological Society of America, the preeminent geological conference in the United States, Skyline faculty combined to chair and present papers in a technical session relating to the presentation of educational materials. Both professors are currently participating in quarterly regional meetings involved with the planning of educational and commemorative activities relating to the observance of the centennial of the1906 San Francisco Earthquake.

3. If the student population has changed, state how the program is addressing these changes.

The student population has clearly changed in terms of a perceptible decline in general educational background, scholastic aptitude, socialization skills, and general audienceship. Nevertheless the earth science instructors have attempted to maintain a high level of scientific rigor and critical thinking in the courses, while at the same time developing new methods of information delivery. This has been accomplished by optimizing the visual aspects of the sciences, through locally developed, innovative video programs produced expressly for Skyline College students. Essentially lectures delivered from the field, these productions often include interviews of leading scientists, timely topics, and carefully designed illustrative graphics. This methodology reaches media-oriented students in a way that lecture alone cannot. It also provides a convenient pedagogical technique of reinforcement since relevant material can be reviewed in the learning center. Students who prefer self-paced learning, or need repetition of material covered in class are given an alternative study opportunity.

4. All courses in this program should be reviewed and, if appropriate, modified every six years. If this has not occurred, please list the courses and explain.

An ongoing review of the catalog of earth science listings has shown that, for a number of reasons, several courses have not been offered in recent years. These include an advanced course, Geology 220 (Historical Geology). Because this course has a prerequisite, enrollments have traditionally been low since most students come to geology late in their community college

career, and transfer to a university before they are ready to enroll. Other previously popular courses, such as Geology 115 (Earthquakes), and 120 (National Parks) do not fulfill general education criteria, and appear to have succumbed to increased tuition costs and textbook fees, as well as the need to insure large enrollments. Oceanography 108 (Field Studies), does not fulfill a lab requirement and no longer fills with students who are only seeking a class for enrichment purposes. Geology 612 (Field Geology-2 units), has historically been allowed to operate with a smaller number of students traveling to distant locations, but budget considerations have severely limited its range. This is coupled with the fact that fewer students are willing or able to set aside time outside of the classroom to attend extended field trips, in part, due to work schedules. Geology 611 (Field Geology-1 unit) presents shorter field trips to nearby localities, and has been modified to allow students to repeat it for credit.

5. If external accreditation or certification is required, please state the certifying agency and status of the program.

Not applicable.

6. Discuss plans for future review and program modification.

Based on the observations presented in #4 above, and after consultation with the division Dean, it is proposed that the following courses be deleted from the college catalog:

Geology 115, Geology 120, Geology 612, and Oceanography 108.

Geology 220 will be retained in “inactive” status for possible use in the future. It is to be expected that this course, when offered, might have a low enrollment because of its prerequisite, and intent for science majors.

PART C: Faculty and Staff

1. List major development activities completed by faculty and staff in this program in the last six years and state what development is needed or proposed by faculty in this program.

Professor Mel Zucker was recently honored for over 30 years of dedicated service to Skyline College. In conjunction with his teaching in a wide range of subject areas, Professor Zucker produces an educational video series that illustrates topics in geology, oceanography, and marine biology. The video series has been made available in the Skyline College Media Center, the educational collection of the U.S. Geological Survey library, and the Pacifica public library. The videos serve as virtual field trips to off-campus locations, provide interviews with leading scientists in the various fields, and present timely information in an accessible manner. The series is also regularly televised throughout the San Francisco Peninsula by Peninsula Television, Pacifica Community Television, and Mid-Coast Community Television stations. Programs on a wide variety of topics ranging from geology (“A Sense of the Earth”) to seismology (“Road to

Prediction") to marine biology ("Coral Grief") have been honored with awards from the EarthVision International Film and Video Festival. Professor Zucker has been a long-time member of the Board of Directors of the Fitzgerald Marine Reserve in Moss Beach, and the technical advisory Committee for the San Mateo County Master Plan for the Fitzgerald Reserve. He is the editor of the "Docent Field Guide" to the reserve, and frequently leads specialized docent enrichment programs for the organization. Professor Zucker also makes presentations to the "Friends of San Pedro Park" in Pacifica, and has taught classes in the Bay Area for the Senior Summer School program. Zucker has served as a reviewer of textbooks in Oceanography, Marine Biology, and Environmental Geology. He is presently a member of the planning committee of the regional "1906 Earthquake Centennial Alliance," which is involved with designing activities to commemorate the anniversary of the1906 earthquake.

Professor Richard Lambert is also a member of the Skyline delegation to the "1906 Earthquake Centennial Alliance," representing the only community college in a group that includes top earthquake scientists, seismic professionals, and geology professors from the major California universities. A teacher and creator of educational multimedia for over thirty years, Professor Lambert has produced media based programs for major conferences such as the Seismological Society of America and the American Association for the Advancement of Science, as well as regional groups such as the Northern California Geological Society and the California Academy of Sciences. Community service presentations at local venues include recent lectures to docents at Woodside's FILOLI estate, the Coyote Point Museum, and the Peninsula Environmental Volunteers. Lambert recently had the honor of co-chairing a technical session at the national meeting of the Geological Society of America with a colleague from San Francisco State University. There he again teamed with Professor Zucker in presenting talks relating to the delivery of scientific information in the classroom. Presently in development is a series of video programs for students and the general public based on historically important geological events. One of the programs, "The San Francisco Earthquake," has been awarded the Western Access Video Excellence (W.A.V.E.) Award for outstanding documentary. Professor Lambert has an extensive field trip repertoire, and also teaches the popular honors class in geology.

The video production team of Zucker and Lambert has recently been the subject of several laudatory newspaper articles (see attached), and has lately been interviewed by a reporter from a national geological journal (in press). This can only help to promote a positive public impression of Skyline.

2. Describe the orientation process for new faculty and staff (include student workers such as tutors and aides).

Earth Science has never had any directly assigned classified staff member, and the instructors have taken the responsibility of preparing, organizing, curating, and storing all of the materials needed for the program. New faculty, such as summer session instructors or evening part-timers, have been mentored by the full time instructor with the class(es) most like that of the new teacher.

3. If recruitment of new and/or diverse faculty is needed, suggest recruitment techniques.

The abundance of high caliber, diverse college graduates from private universities, the University of California and the California State University system, plus the proximity of the United States Geological Survey would provide a wealth of possible contacts to insure a wide range of qualified candidates.

PART D: Facilities, Equipment, Materials and Maintenance

1. Discuss the effectiveness of the facilities, equipment, equipment maintenance, and materials for the program to meet its goals and focus. Include if they impact success and if they are accessible to all students.

All of the classrooms and laboratories at Skyline used by the earth sciences are poorly designed. Even a relatively new classroom used for geology classes, 5132B, is inferior with sound bleeding from one section to the other. Furthermore, heavy samples and demonstration equipment must be packed and transported across campus from a distant storage area for use in this room. In addition, this "state of the art" classroom lacks certain media options which were requested, notably slide projectors, which are a valuable, high resolution tool for presenting visual media. Power Point programs have definite advantages, but they are not necessarily always the best tool for high quality, detail rich visual presentations. The proposed "improvements" related to the new science annex and the redesigned building 7 are not well designed for the earth sciences. In fact, things look only to get worse. Earth science lecture classes will no longer have storage-prep rooms adjacent to them to facilitate convenient access to the diverse and often cumbersome materials needed for instruction. Geology and Oceanography lab classes will continue to share a laboratory with chemistry. Most of the internal design elements from furniture to fixtures are intended for chemistry classes, and are ill suited to the earth sciences.

2. List projected needs.

Earth Science instructors have repeatedly and strongly put forth request after request for the single most important need in the forthcoming reformulation of the science complex, viz. sufficient, accessible storage space for lab materials, sample collections, and field trip equipment, as well as prep rooms for instructional materials directly adjacent to lecture rooms and lab areas. It is also important that earth science media needs be taken into account in the design of the new classrooms, rather than a "one size fits all" approach as was the case in the recent electronic classroom makeover.

3. Describe the use of technology in the program and discuss if technology is current and comparable to other college and business or industry.

The basic supplies for teaching geology and oceanography are decidedly low tech: rocks, minerals, seawater samples, sieves, etc. For this reason the Earth Science department has been very frugal over the years in budget requests. Compared to other sciences the Earth Science budget spending is miniscule. Perhaps because so little is requested, it might appear that the program could survive with even less. One area of difficulty is in technology. In order to maintain their high standards of educational quality, the Earth Science faculty members have often been forced to purchase instructional equipment at personal expense when budget request items were denied. For example, not one of the four items of equipment requested last year was granted, so two (a video camera and a slide scanner) were obtained by individual purchase. This is in addition to large sums voluntarily spent for supplies to support the production and distribution of video materials for the TV series. As for computer technology, neither instructor has ever had a complete, new computer system provided by the school. The program has heretofore relied on outside grant money, hand-me-down equipment, and personal systems brought in from home.

4. If appropriate, describe the support the program receives from industry. If the support is not adequate, what is necessary to improve that support?

Although the Earth Science program receives no regular direct support from commercial industries, the Western Regional Office of the United States Geological Survey has been an ongoing source of data, maps, media, and other valuable materials to the program. They have also been very generous in making many top scientists available to Skyline College for interviews, and research assistance for the instructor-produced television program, “Down To Earth.” Other agencies have provided similar assistance including the California Geological Survey, the Association of Bay Area Governments, and the California Seismic Safety Commission. Special mention must be made of Pacifica Community Television which provides their studio facilities, editing equipment, and personnel for the production of the television series.

PART E: Budget Request

1. What resources (staff, facilities, equipment and/or supplies) will be needed in the next six years?

It is possible that within the next six years at least one of the earth science instructors will retire, and will need to be replaced. That means a new instructor will inherit a flawed design plan. If it is not already too late, the facilities plan should be reevaluated to better accommodate the needs of geology and oceanography. Earth Science courses and related activities have been a valuable asset to the college, and the community. They have traditionally operated in a quiet, smooth, and efficient manner, but their needs appear to have been underestimated or overlooked in the recent planning process.

2. If appropriate, discuss methods the program could share resources with other programs in the College and District.

One of the basic issues in sharing resources is that many items, consumer electronic equipment in particular, tend to become unreliable with multiple users. Equipment often experiences mechanical problems that are unrecognized, or go unreported. Shared equipment might not be available on short notice, or during school breaks. The issue of sharing was mentioned in regard to several of the program's recently requested equipment budget items. Although many items may well be shared productively, it is the opinion of Earth Science that when a carefully considered request is made for a needed, fragile item, that it not automatically be considered as something to be shared.