

**DEPARTMENT OR PROGRAM: Biology Department, including Health Science**  
**DIVISION: Math/Science**

## **I. DESCRIPTION OF PROGRAM**

The Biology department, including Health Science, offers courses serving a range of educational goals for students, including transfer to baccalaureate institutions in both non-science and science majors, prerequisites for programs including horticulture, nursing, and medical assisting, and Health Science courses for general education. The Biology program is almost entirely conducted in lecture and lab classrooms on the second floor of building 36, with occasional lecture classes on the first or third floor, and rarely in other buildings if needed. One or two sections of Biology and Health Science courses are offered in the Coastside Center.

The following courses are offered this academic year (2009-2010): Biology 100, 102, 110, 123, 126, 127, 128, 130, 145, 184, 195, 210, 220, 230, 240, 250, 260, 666, 680, 880, and Health Science 100. Biology 126, 127, and 128 are cross-listed with Physics 126, 127, and 128 and make up the sequence in the Aurora/CalTeach program to provide students with experience teaching K-12 math and science. A new course, Biochemistry seminar, Bio 680, cross listed with Chem 680, is offered in spring 2010. Beginning Fall 2010 the department will offer Biology 310 (Nutrition), offered through Summer 2010 as Consumer Arts and Science 310.

The department offers multiple sections of Biology 100, 110, 130, 240, 250 and 260 to meet the requirements for general education, transfer, and pre-nursing demand. Due to budget reductions across campus, the number of Bio 100 and Bio 130 sections will be decreased beginning Fall 2010, and if further cuts are necessary, sections of either Bio 240 or 250 will be reduced. This is unfortunate because demand for all these courses is high as indicated by long wait lists in most sections and courses, including online offerings. Due to decreased demand the department does not currently offer any Health Science courses except HSCI 100. Through this academic year HSCI 100 is 2 units and is required for AA and AS degrees, but as of Fall 2010 the course will be 3 units, optional for AA and AS degrees, and the department will reduce the number of sections offered.

The Biology department has five full-time Biology professors and a full-time Horticulture professor who now teaches in Biology. One Biology retiree is in the second year of post-retirement teaching. The department has ten adjuncts teaching courses Spring 2010 and nine scheduled to teach Fall 2010. Biology courses taught by full-timers Spring 2010 are 100, 102, 110, 126, 127, 130, 145, 195, 210, 220, 230, 250, 260, and Health Science 100, with sections of some taught by adjuncts. Biology 240 is the only course taught only by adjuncts.

The department offers daytime and evening schedules that are practical for students and fit into building 36 spaces, and also offers online sections of several courses (Bio 100, 130, 145, HSCI 100), as well as a hybrid course (Bio 260). In Fall 2010 Bio 310 will be

offered online. The department works with Chemistry and Physics faculty to coordinate schedules of courses required by Biology majors.

## II. STUDENT LEARNING OUTCOMES (SLOs)

- a. Briefly describe the department's assessment of SLOs. Which courses or programs were assessed? How were they assessed? What are the findings of the assessments?

The Biology department faculty incorporated SLOs in our courses long before they had that name; learning objectives were listed in course outlines along with means of assessment, including lecture exams, lab reports, and various student projects. At department meetings, conferences and training workshops faculty have always discussed and investigated successful approaches to student learning and demonstration of their learning of course objectives. As of Fall 2008 SLOs had been developed in all Biology and Health Science courses, assessment has been ongoing and partially complete in more than half of our courses. Pre-tests have been added to some courses to assist in SLO assessment. Detailed SLO reports were written and submitted for all Biology and Health Science classes (including all sections) offered in Fall 2008. Results of assessments in many courses were not completed in Fall 2008 and are in progress for Fall 2009. When assessments were completed findings fell into two categories: student success was adequate and the approach would be continued, or student success was less than desired, and improvements would be made in the lecture or lab work or student assignments for the SLO. In Spring 2010 work on SLO assessment from Fall 2009 will be entered into the Tracdat program. Specific SLO assessments for each course will be scheduled for Fall 2010 and Spring 2011 to set the pace to assess and determine appropriate actions on all SLOs for all courses in a four-year cycle.

- b. Briefly evaluate the department's assessment of SLOs. If applicable, based on past SLO assessments, 1) what changes will the department consider or implement in future assessment cycles; and 2) what, if any, resources will the department or program require to implement these changes? (Please itemize these resources in section VII of this document.)

Several courses in Biology are offered in multiple sections taught by different instructors, all addressing the same set of SLOs. The Biology department faculty will meet this semester to determine the degree of detail required for assessing each SLO for the semester, and the appropriate benchmarks of success in SLO assessment. The department will work to clarify and make more uniform the SLO work in each course, without infringing on academic freedom. In addition to the SLOs that match GE-SLOs, there are several topics discussed in biology and health science courses that directly address GE-SLOs, but the topics are embedded in topics and units. For example, in HSCI 100, social awareness and diversity is central to many health conditions. Ethical responsibility enters in any discussion that relates to global ecosystem changes, genetic modification of organisms, personal choices that impact health and the environment. Quantitative skills are part of genetics and diffusion discussions.

From recent training in Tracdat to enter department progress on SLOs, it was clear that the best measure of success has not been established. For some examples: Should all of a class achieve 75% or better on a series of exam questions, or should 75% of a class achieve 100% on the same series of questions? Should pre-tests be given at the beginning of a semester retroactively count only students who complete the course, so results on course exams and assignments that comprise "post-tests" show what the students who completed the course learned? Must a particular SLO be assessed by a highly specific choice of questions from exams in each instructor's course, or the same questions in every section, or the sum of work related to the question, including overall exam scores and specific lab reports?

Nevertheless, as a result of assessing SLOs, courses or individual sections have implemented several changes, which include: rewriting of course SLOs, rewriting of lab exercises to increase student engagement and practice in scientific investigations, introduction of new lab exercises, introduction of new student projects, modifications of schedules so topics follow each other in more useful order, clarification of lecture or lab presentations or background assignments, increased guidance and practice for students in designing experiments or oral presentations.

- c. Below please update the program's SLO Alignment Grid below. The column headings identify the General Education (GE) SLOs. In the row headings (down the left-most column), input the course numbers (e.g. ENGL 100); add or remove rows as necessary. Then mark the corresponding boxes for each GE-SLO with which each course aligns.

If this Program Review and Planning report refers to a vocational program or a certificate program that aligns with alternative institutional-level SLOs, please replace the GE-SLOs with the appropriate corresponding SLOs.

GE-SLOs→ Program Courses ↓	Effective Communication	Quantitative Skills	Critical Thinking	Social Awareness and Diversity	Ethical Responsibility
Bio 100	2, 3		1, 3	4	4
Bio 102	1, 2		2	1, 2,3,4	3
Bio 110	1, 2	3, 4	3, 4	5	
Bio 123	2	1	1	2	
Bio 126	1, 2		2	3	3
Bio 127	1, 2		2	3	3
Bio 128	1, 2		2	3	3
Bio 130	√			√	
Bio 145	1, 2, 3		4		6
Bio 184	√		√	√	√
Bio 195	√	√	√	√	
Bio 210	√	√	√	√	
Bio 220		3, 4	4, 8, 9		1
Bio 230	1-7	6	3, 4, 6		
Bio 240					
Bio 250	√				

Bio 260	√	√	√	√	
Bio 310	√	√	√		
Bio 666					
HSCI 100	1, 2, 3		4, 8, 10		
HSCI 112-125					

### III. DATA EVALUATION

- a. Referring to the Enrollment and WSCH data, evaluate the current data and projections. If applicable, what programmatic, course offering or scheduling changes do trends in these areas suggest? Will any major changes being implemented in the program (e.g. changes in prerequisites, hours by arrangement, lab components) require significant adjustments to the Enrollment and WSCH projections?

Enrollment in Biology and Health Science classes increased 14.9% and 7.7%, respectively, from 2006/7 to 2008/9. In the same period the college enrollment overall fell 21.3%. Biology and Health Science WSCH increased 12.2% and 8.2% compared to a college increase of 6.4%. The demand for pre-nursing and pre-dental courses continues to grow and the department has been adding sections every year through Spring 2010. Projection is meaningless as a simple continuum of the past three years and does not take any real parameters into consideration, such as the current extreme economic crisis. Required cuts in Fall 2010 due to strict budget considerations, and the change of Health Science from A.A. degree requirement to optional choice, accompanied by converting HSCI 100 from 2 units to 3 units, will likely reduce enrollment and WSCH in Biology and Health Science. In Spring 2010 there are nine sections of HSCI 100 offered, including three online, and each is 2 units (total of 18 units). For Fall 2010 there will be three sections offered, with one online, and each will be 3 units (total of 9 units).

The online sections of BIOL 100, HSCI 100 and BIOL 130 are in high demand as shown by full wait lists for these classes. Online classes accommodate a variety of learning styles and help students craft workable schedule. With cancellation of face to face sections, the department is keeping online sections, and for these times of financial crisis, adding more students than we usually do. The Biology department took on the teaching of Nutrition, formerly a Consumer Arts and Science Dept. offering. The class will be numbered Biol 310, and will be taught starting in Fall 2010 as a 3 unit online class. These courses should increase enrollment and WSCH in Biology and Health Science and make up somewhat for the other losses.

The department has converted all BIOL 260 (physiology) sections to hybrids, and will convert BIOL 220 (botany) to hybrid in Spring 2011. While Biology faculty strongly agree that all lab courses must have on-campus lab experiences for one unit (three hours/week), the second unit of lab may utilize online resources and for student research and investigation. This provides for better schedule coordination between disciplines, especially with chemistry and physics, and better accommodation of majors students with multiple science and math courses every semester. This should have a positive impact on enrollment in 200 level courses for Biology (and Chemistry and Physics), even in the current economy.

- b. Referring to the Classroom Teaching FTEF data, evaluate the current data and projections. If applicable, how does the full-time and part-time FTE affect program action steps and outcomes? What programmatic changes do trends in this area suggest?

Including the full-time Horticulture professor now teaching Biology, the department employs six full-time instructors, one retiree on post-retirement, and ten adjuncts teaching Spring 2010, while the FTEF for Biology 2008/9 was about 21. While the college percent of full-time increased from 47 to 51 between 2006/7 and 2008/9, Biology decreased from 60 to 50% (and Health Science from 30 to 20%). Due to the addition of the horticulture faculty, the decrease in FT percent due to retirement without replacement should be slowed in 2010/11. The "new" full-time instructor is teaching general biology (BIOL 100 and 110) and not the greatest needs of the department, microbiology and anatomy/physiology (BIOL 240, 250, 260), for which Biology has requested faculty positions for several years. The department does have full-time faculty teaching anatomy and physiology, in addition to adjuncts, so program development is not as seriously affected as in microbiology, where no full-time faculty has taught since 2005.

Due to the reduction in Health Science section offerings, there is now one full-time faculty and one adjunct teaching the three sections, so program action can be accommodated without difficulty (so FT for Fall 2010 Health Science will be 33%). The full-time faculty wrote the new course outline and appropriate documents, and worked with COI to change the units for HSCI 100. HSCI 100 is now a three-unit class at all three campuses in the district.

- c. Referring to the Productivity [LOAD] data, discuss and evaluate the program's productivity relative to its target number. If applicable, what programmatic changes or other measures will the department consider or implement in order to reach its productivity target? If the productivity target needs to be adjusted, please provide a rationale.

With a standard productivity goal of 525, the college achieved this between 2006/7 and 2008/9, from 492 to 563, an increase of 14.4%. The Biology department increased 8.4%, from an already high 617 to 669. Health Science increased 36.6%, from 519 to 709. Productivity is not an issue in Biology (we work hard for the money)!

#### **IV. STUDENT SUCCESS EVALUATION AND ANALYSIS**

- a. Considering the overall "Success" and "Retention" data, briefly discuss how effectively the program addresses students' needs relative to current, past, and projected program and college student success rates. If applicable, identify unmet student needs related to student success and describe programmatic changes or other measures the department will consider or implement in order to improve student success. (*Note that item IV b, below, specifically addresses equity, diversity, age, and gender.*)

The department has a problem reconciling the high demand for its courses--100 level for GE and under-prepared or newly-interested majors, and 200 level for life science majors, pre-nursing and other health-related fields--with inadequate preparation of students. Lack of preparation for 100 series courses can be attributed mostly to poor English reading and writing skills. Lack of preparation contributes to high attrition in these classes. Lack of preparation for 200 series courses is due to skipping chemistry or biology prerequisites. In general students are not realistic about their abilities, and try to take the courses they want to save time, when they end up losing time by having to repeat courses, or worse, they are not able to pursue their chosen path

because they fail courses. The Educational Master Plan states: "The proportion of students who place below transfer-level in mathematics (80-82%) and English (70-72%) has remained relatively stable over the last 10 years; however, some data suggests that a greater proportion of students are placing at the lowest levels....." and emphasizes the challenges the college faces in preparing students for college-level work.

Science courses are traditionally considered more difficult than non-science courses, due to the math component, the additional hours of class time, the technical vocabulary, and the logical basis for success. Biology faculty work to develop and implement teaching methods in lecture and laboratory so that students are motivated, challenged, and encouraged to actively learn science fundamentals and approaches to general problem-solving and analytical thinking. Retention in Biology and Health Science was unchanged from 2006/7 to 2008/9 (79% and 87-86% respectively), and below college levels (85-84%). On the other hand success in Biology improved somewhat, from 60 to 64% (but Health Science decreased to 65% from 68%), though it is below the college rate of 70%. Several Biology faculty have been working with Basic Skills Initiative in interdisciplinary groups (IFIG) to address concepts of student motivation and sense of college community, to improve student success directly and indirectly, as Biology faculty and Basic Skills faculty and counselors get to work together and communicate better. Unfortunately with reduction in counseling due to budget cuts there is less opportunity in the future for implementing some ideas for improved counseling of students about taking courses only when adequately prepared.

- b. Briefly discuss how effectively the program addresses students' needs specifically relative to equity, diversity, age, and gender. If applicable, identify unmet student needs and describe programmatic changes or other measures the department will consider or implement in order to improve student success with specific regard to equity, diversity, age, and gender.

Ethnic enrollments in Biology and Health Science are a close match to the college overall. The exceptions are fewer Asian students and more Black and Latino in Health Science. Gender enrollments in Health Science match the college overall, while Biology has significantly higher female enrollment (59% compared to 49% for the college). Age enrollments match the college with the exception that there are fewer of the oldest students, so in Biology 40% of the students are 20-24 compared to 32% for the college.

In terms of success the differences between Biology and the college reflect the difference in success overall (64% compared to 70% in 2008/9), and the distribution is similar except for a higher rate of success for Asian students in Biology (both Biology and the college have 75% success for Asians, but compared to the overall of 64% vs 70%, the 75% success rate of Asian students is relatively higher than for other students in Biology).

The college has a fairly constant withdrawal rate of 15-19% across ethnic, gender and age groups. Biology's withdrawal rate is higher overall, about 21%, much of which is due to BIOL 240, 250, and 260, the pre-health courses with very high demand, and withdrawal is highest for Black, Filipino and Hispanic students, while lower for Asian students. As stated in the Educational Master Plan, "data over the last decade continue to demonstrate comparatively lower rates of student success among African-American, Hispanic..." Withdrawl rate may be in part related to students skipping pre-requisites before enrolling in these classes.

Faculty in the Biology department are participating in the Basic Skills Initiative on campus that targets, in part, low performing groups. From this initiative, faculty are participating in professional development workshops that provide strategies for reaching and engaging low performing students.

## V. REFLECTIVE ASSESSMENT OF INTERNAL AND EXTERNAL FACTORS AND PROGRAM/STUDENT

- a. Using the matrix provided below and reflecting on the program relative to students' needs, briefly analyze the program's strengths and weaknesses and identify opportunities for and possible threats to the program (SWOT). Consider both external and internal factors. For example, if applicable, consider changes in our community and beyond (demographic, educational, social, economic, workforce, and, perhaps, global trends); look at the demand for the program; program review links to other campus and District programs and services; look at similar programs at other area colleges; and investigate auxiliary funding.

	INTERNAL FACTORS	EXTERNAL FACTORS
<b>Strengths</b>	<p>Dedicated, enthusiastic, cooperative full-time faculty who pay close attention to students' strengths and weaknesses; some adjunct faculty with similar commitment to student success; supportive, pro-active division leadership; positive college leadership.</p> <p>Faculty innovation and flexibility allowing for improved scheduling of sections and ability to add more sections of high-demand courses. Faculty taking the lead to develop online courses, hybrid courses, and CalTeach/Aurora program offering K-12 teaching experience.</p> <p>Faculty participation in a variety of science-related professional development opportunities keeps program current. Both adjunct and full time faculty have been formally involved in collaborative projects and networking activities both on campus and with local educational institutions including CSUs and community colleges.</p>	<p>Need and opportunity for science higher education and career paths in the Bay Area; continuing need for health professionals in the local and national workforce.</p> <p>Support from UC Berkeley for CalTeach/Aurora program; seminar leadership (gratis) in Cell Biology by experienced biotechnology professional; participation in ROP advisory committee and BABEC (biotech) support of biotech course with free reagents</p> <p>Connection to professional organizations such as the NSF-funded CCB FEST (Community College Biology Faculty Enhancement through Scientific Teaching), National Science Teachers Association (NSTA), Human Anatomy and Physiology Society (HAPS), contributes to opportunities to improve curriculum and align it with other colleges and universities.</p>

<p><b>Weaknesses</b></p>	<p>Full-timers stretched thin with non-classroom assignments: de-facto department chair coordinates SLO work, program review, scheduling of classes including coordination with other departments, management of adjunct faculty; several faculty conduct open laboratories, are active in college and district committee work, have written course outlines for new courses or online versions of courses. By writing this program review it has been realized that the department is badly lagging in updating course outlines in general.</p> <p>Absence of full-time microbiology instructor to provide program development.</p>	<p>Poor preparation of students in English, math and science; unrealistic expectations of students in terms of course difficulty and amount of time needed to study to succeed; heavy demands on students outside of school, including work and family responsibilities.</p> <p>Lack of effective advising/counseling in the sciences. Students comment that counseling/advising is poor in the sciences. Poor communication between counseling and Biology on the topics of pre-requisites, recommended preparation, opportunities in CalTeach.</p> <p>Horrendous state of California budget stifling our ability to respond to high demand for increased number of course sections.</p>
<p><b>Opportunities</b></p>	<p>As more faculty perform office hours in the ISC (Integrated Science Center), students have a greater sense of community in the division, find more opportunities for study groups and see other students getting help from professors; the division has a great opportunity to improve student success if more faculty do office hours in the ISC.</p> <p>Recommendations made by the Edison Project Task Force for a new Horticulture/Floristry/Biology lab would contribute to the department's ability to add more lab classes.</p>	<p>Even in the current economic crisis, Biotech sector is still employing and offering opportunities for internships to CSM science students.</p> <p>Health-related careers are in high demand and continue to drive enrollment in the sciences.</p> <p>The San Mateo Educational Foundation or the Presidents Fund for Innovation may be an entity to approach for grants for tutoring and model repair, and/or replacement.</p>

<b>Threats</b>	<p>Reduction of class offerings will result in reduction of adjunct hours and in some cases loss of adjunct faculty; adjuncts hired in the past five years are the first to go and are our best adjuncts, since some long-term adjuncts were hired with less faculty involvement and are not as committed to students and programs as newer hires.</p> <p>Reduction in class sections, especially classes that are traditionally high in enrollment (Bio 100, Bio 110, HSCI 100) may have a negative impact on campus-wide productivity.</p> <p>Wear and tear on models and specimens used by many of the biology classes, with no budget or capacity by current staff to repair or replace them.</p>	<p>California economic future directly affecting community college funding and affecting preparedness of students by reductions in K-12 education; continued lack of commitment of society to the importance of education in general and science education specifically.</p> <p>Current budget difficulties have the potential to negatively affect staffing levels in the ISC and open lab hours in anatomy (BIOL 880).</p> <p>Travel for professional development opportunities has been eliminated. As a result faculty must pay out of pocket for travel or decline invitations to present at conferences.</p>
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- b. If applicable, discuss how new positions, other resources, and equipment granted in previous years have contributed towards reaching program action steps and towards overall programmatic health. If new positions have been requested but not granted, discuss how this has impacted overall programmatic health. (You might reflect on data from Core Program and Student Success Indicators for this section.)

The last new full-time Biology faculty was hired in Fall, 2005, and has contributed to Biology programs in diverse ways: revival and improvement of academic standards in field biology, wildlife, and environmental conservation courses (important for GE students and some biology majors' programs); availability of another full-time faculty in anatomy and physiology courses (important in program development in these high-demand pre-health classes); replacement of retired faculty in zoology (vital biology majors course); participation of science faculty in college committees (currently vice-president of academic senate, and will be president in 2010-2012); contribution to SLO work in the department; increased diversity in biology faculty.

Important equipment granted in recent years included funds for prosecution of new cadavers, and to pay instructors for Bio 880, an open anatomy lab that meets both weekdays and weekends. Attendance on weekends is usually over 100 students, and may be contributing to the increase in student success in recent years (60->64% 2006/7-2008/9), and may show further increase when data for Fall 2009 becomes available.

The microbiology position has been open for five years. The current adjuncts are as seriously committed to program development as possible with limited time on campus. They have worked on SLO's for microbiology and worked to keep up to date and innovative in the class. However, their office hours are limited. Their contribution to the biology department and the campus community as a whole is limited. They do not coordinate with anatomy and physiology instructors on program actions related to pre-nursing and other health fields. The adjuncts teach at other community colleges and constantly seek secure employment outside of the college.

For Fall 2010 there will probably be a change in teaching assignments for microbiology, due to cuts of other biology course sections specialized needs and qualifications. This will disrupt the tenuous continuity the microbiology program currently has.

If the recommendations made by the Edison Project Task Force are accepted by cabinet and implemented, the new Horticulture/Floristry/Biology lab would contribute to the department's ability to add more lab classes. Our program is extremely efficient; adding double lab sections in the new lab room would contribute to the overall efficiency of the biology department and the college. Additional lab facilities would provide much need relief for the present highly impact lab facilities and provide for better coordination with the horticulture/floristry program.

The Edison Task Force recommended the Native and Nettle gardens, the green lawn adjacent to the gardens, and natural habitats on the south slope of B12 and west slope of B19 be preserved in place. These are the only well-established, undisturbed habitats left on campus after much of the construction disruption to habitats used by biology classes. Students in a diversity of classes use these gardens and natural areas for HBA and for many lab activities that provide more 'hands-on' experiences for students. The wildlife and plants in these areas contribute in a significant way to the strengths and uniqueness of our biology offerings. Some of the plants grown in the current greenhouses and in the natural areas on the slopes of B12 and B19 are rare and not available from biology suppliers.

## VI. Goals, Action Steps, and Outcomes

- a. Identify the program's goals. Goals should be broad issues and concerns that incorporate some sort of measurable action and should connect to CSM's *Institutional Priorities 2008-2011, Educational Master Plan, 2008*, the Division work plan, and GE- or certificate SLOs.

The goals of the Biology department are well-aligned with several of CSM's institutional priorities and GE-SLOs. These in turn relate to points of the EMP as seen in part c below. Several of these goals are mutually beneficial, and actions on one will include interactive processes.

Goal 1. Increased student success through individual efforts of each faculty member, department cooperation and planning, interdisciplinary conversations and projects, and incorporation of GE-SLOs of Effective communication, Quantitative skills and Critical thinking into courses.

Goal 2. Academic excellence, especially components of employment readiness, SLO cycles and improving effectiveness of distance learning.

Goal 3. Relevant, high-quality programs and services, notably building capacity for allied health programs and further diversifying delivery modes.

Goal 4. Enhanced institutional dialog, especially increased faculty participation in shared governance, improved campus-wide communication and promoting a diverse, open climate in general and in decision-making, along with incorporation of GE-SLOs of Social awareness and diversity and Ethical responsibility.

- b. Identify the action steps your program will undertake to meet the goals you have identified.

Goal 1: Faculty meetings will provide group training and work on TracDat entry of SLO assessment cycles. This will promote exchange of ideas on successful methods for improving SLO content and assessment, and feedback into teaching approaches, to enhance student retention and success. Faculty who participated in BSI-sponsored IFIG projects 2009-10 will incorporate successful pilot projects permanently into courses. Faculty will seek multiple ways to communicate major requirements, course prerequisites, opportunities such as CalTeach program. These include better communication with counseling services, putting information on the department website, and other venues.

Goal 2: Suggested course sequences for Biology majors will be disseminated on the Biology department website and other means determined by the Math/Science division faculty to compensate for lack of counseling support. Faculty will promote awareness and enforcement of prerequisites for Biology classes, especially English preparation for 100-level courses and Chemistry preparation for 200-level courses. Faculty will attend program development training opportunities to improve distance learning. Faculty will update all due and overdue course outlines for submission to COI in Fall 2010.

Goal 3: Faculty will promote recommendations made by the Edison Project Task Force for a new Horticulture/Floristry/Biology lab.

Goal 4: Faculty will attend campus meetings, participate in college committees, hold office in academic senate, work with the division dean and division faculty on interdisciplinary projects, communicate successful methods of student engagement and community building to the division and other divisions.

- c. Briefly explain, specifically, how the program's goals and their actions steps relate to the *Educational Master Plan*.

See part a above. Elements of the EMP that are relevant to Biology department goals and actions include:

"To ensure successful student persistence, retention, and goal attachment, student services staff and instructional staff will need to collaborate closely....

Faculty, staff, and administrators will need professional development to help them develop the strategies and pedagogies that ensure success among increasingly diverse student populations....

The demand for workforce preparation and career services will increase.... High-tech and knowledge-based professions will continue to grow in the region, with implications for foundation courses and other curricula in the biological and physical sciences, mathematics, Information technologies, and computer science.

Multiple projections suggest that the healthcare industry will continue to grow steadily with demand not only for healthcare workers with advanced degrees, but nurses, medical aides, caregivers, and IT workers who can support the emerging medical technologies.

The continued development of a comprehensive online instructional program requires faculty from multiple disciplines to be trained, skilled, and committed to distance education.

Students will continue to expect faculty to develop and maintain information technology competencies and to use technology as a matter of course (e.g. email and voicemail).

The college cannot underestimate the impact of positive personal interactions on

students' attitude toward their college experience and the importance of the personal touch.

CSM needs to develop a comprehensive and well-supported professional development program that enhances the abilities for faculty, staff, and administrators to work effectively with diverse populations...."

- d. Identify and explain the program's outcomes, the measurable "mileposts" which will allow you to determine when the goals are reached.

Goal 1. Data from PRIE should show higher retention and success rates; SLO results should show higher percentage of classes meeting SLOs

Goal 2. Course outlines approved by COI for overdue courses; formalization of SLO data by entry into TracDat from all courses in Biology, plus HSCI 100 (the only health science course currently being taught). Data from PRIE should show higher retention and success rates attributable to distance learning courses

Goal 3. Opening of a new Horticulture/Floristry/Biology lab

Goal 4. Incorporation of new exercises and assignments in Biology courses based on work with BSI, counseling; higher retention and success rates for students of all ethnicities

## **VII. SUMMARY OF RESOURCES NEEDED TO REACH PROGRAM ACTION STEPS**

- a. In the matrices below, itemize the resources needed to reach program action steps and describe the expected outcomes for program improvement.\* Specifically, describe the potential outcomes of receiving these resources and the programmatic impact if the requested resources cannot be granted.

\* *Note:* Whenever possible, requests should stem from assessment of SLOs and the resulting program changes or plans. Ideally, SLOs are assessed, the assessments lead to planning, and the resources requested link directly to those plans.

Full-Time Faculty Positions Requested	Expected Outcomes if Granted and Expected Impact if Not Granted
<p><b>Request for Microbiology Instructor</b>  The demand for pre-health care courses continues to increase. The department has responded by increasing the number of sections of microbiology offered. Four sections are offered in each semester, spring and fall, and two sections in summer. There is currently no full-time faculty teaching this course since the retirement in 2005 of the full time instructor. Microbiology is a highly specialized field that cannot be taught by a general biology instructor, unless he/she is retrained in the field.</p>	<p>If granted, the Microbiology Instructor will coordinate the microbiology program at CSM. He/she will teach the majority of the sections of microbiology. The instructor can keep the curriculum updated, tend to students during open lab and office hours, and keep the program vibrant. He/she will coordinate SLOs and assessment, work with the stockroom manager to develop laboratory materials and coordinate purchases of supplies and equipment, contribute to ongoing biology department and college activities and initiatives.</p> <p>In the absence of a full time position in microbiology, the classes will continue to be staffed by adjunct instructors. Office hours will continue to be limited. The absence of leadership in the course will deprive the department and campus community of a vital contributor.</p>
<p><b>Request for Anatomy and Physiology Instructor</b>  The demand for pre-health care courses is high and growing. The department has responded by increasing the number of sections of anatomy and physiology offered. The department offers 6 anatomy and 3 physiology sections in each semester, fall and spring, and 2 anatomy sections in summer. Although there are 3 full-time faculty teaching anatomy and physiology, one has very limited units available to A&amp;P. Anatomy and physiology are specialized fields that cannot be taught by a general biology instructor, unless he/she is specifically trained in the field. The quality of a program hinges on full-time faculty who keep the curriculum updated and vibrant, tend to students during open lab and office hours. Success and retention of students in microbiology, anatomy, and physiology courses will be best served with full time faculty who collaborate with support services to ensure student preparation for the courses, in addition to teaching them.</p>	<p>If granted the Anatomy and Physiology instructor will collaborate with our skilled team of anatomy and physiology instructors, teach several sections of anatomy and physiology each semester. The instructor will help keep the curriculum updated, tend to students during open lab and office hours, help coordinate SLO assessment, and contribute to ongoing biology department and college activities and initiatives.</p> <p>In the absence of a full time position in anatomy and physiology, many sections will continue to be staffed by adjunct instructors. Office hours and open lab hours will continue to be limited by instructor availability. The department and campus community will be without a vital contributor.</p>

- b. For instructional resources including equipment and materials, please list the exact items you want to acquire and the total costs, including tax, shipping, and handling. Include items used for instruction (such as computers, furniture for labs and centers) and all materials designed for use by students and instructors as a learning resource (such as lab equipment, books, CDs, technology-based materials, educational software, tests, non-printed materials). Add rows to the tables as necessary. If you have questions as to the specificity required, please consult with your division dean. Please list by priority.

Resources Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
<p><b>Item:</b> Conical tissue homogenizer 3 ml #1976-10021  <b>Number:</b> 10  <b>Vendor:</b> Bellco  <b>Unit price:</b> \$126 inclu. tax, ship  <b>Total Cost:</b> \$1260  <b>Status*:</b> new</p>	<p>Cell Biology classes prepare crude protein extractions from one animal tissues to study proteins. This is in addition to purchase of prepared protein extracts. If broadened to more tissues it will provide more hands-on experience plus a greater ability to investigate and compare proteins from different tissues and organisms. The current crude extraction method is too inefficient to expand. Homogenizers will allow expansion to more tissues and replace the purchased proteins completely (except for size standards).</p>	<p>SLOs 1, 6, 7 for BIOL 230 (Cell Biology) can be better assessed, and student success in them is expected to improve with more student-directed investigations.</p>
<p><i>Item: Models for several biology classes, especially anatomy and physiology.</i></p> <p><i>The department is in need to replace and upgrade models used in several labs. Due to their high cost and the limited amount of funding available this year, we are not including an itemized list in this year's program review. We would like to state the need for the future.</i></p>	<p><i>Models are critical to improve and solidify student learning, and to improve retention. Expected outcome is increased wear and tear of models we have in our labs.</i></p>	<p><i>Improve student retention and success.</i></p>

\*Status = New, Upgrade, Replacement, Maintenance or Repair.

## VIII. Course Outlines

- a. By course number (e.g. CHEM 210), please list all department or program courses included in the most recent college catalog, the date of the current Course Outline for each course, and the due date of each course's next update.

Course Number	Last Update Date	Six-year Update Due Date
Bio 100	Nov-04/Distance Aug-09	Nov-10/Aug-15
Bio 102	May-08	May-14
Bio 110	May-02	overdue-in progress for Fall 10
Bio 123	Oct-03	overdue-in progress for Fall 10
Bio 126	Feb-09	Feb-15
Bio 127	Feb-09	Feb-15
Bio 128	Feb-09	Feb-15
Bio 130	Feb-07/Distance Aug-09	Feb-13/Aug-15
Bio 145	May-06	May-12
Bio 184	May-88	overdue-will finish for Fall 10
Bio 195	Apr-88	overdue-will finish for Fall 10
Bio 210	Nov-04	Nov-10
Bio 220	Mar-05	Mar-11
Bio 230	Mar-06	Mar-12
Bio 240	May-02	overdue
Bio 250	Nov-04	Nov-10
Bio 260	May-06/Distance Apr-08	May-12/Apr-14
Bio 310	Aug-09	Aug-14
Bio 666	May-96	overdue
Bio 675	Apr-90	overdue
HSCI 100	Dec-06/Distance Oct-09	Dec-12/Oct-15
HSCI 112	Apr-88	overdue
HSCI 113	Dec-03	course will be banked
HSCI 114	Dec-03	course will be banked
HSCI 119	May-02	course will be banked
HSCI 125	May-02	course will be banked

## IX. Advisory and Consultation Team (ACT)

- a. Please list non-program faculty who have participated on the program's Advisory and Consultation Team. Their charge is to review the *Program Review and Planning* report before its submission and to provide a brief written report with comments, commendations, and suggestions to the Program Review team. Provided that they come from outside the program's department, ACT members may be solicited from faculty at CSM, our two sister colleges, other community colleges, colleges or universities, and professionals in relevant fields. The ACT report should be attached to this document upon submission.

Due to time constraints the department did not have an outside reader for this program review. If requested this will be arranged for after spring break.

- b. Briefly describe the program's response to and intended incorporation of the ACT report recommendations.

## X. PROGRAM REVIEW PARTICIPANTS AND SIGNATURES

Date of Program Review evaluation:

Please list the department's *Program Review and Planning* report team:

Primary program contact person: Kathy Diamond

Phone and email address: X6602 diamondk@smccd.edu

Full-time faculty: Kathy Diamond, Tania Beliz, Theresa Martin, Carlene Tonini

Part-time faculty:

Administrators

Classified staff:

Students:

<hr/> <i>Primary Program Contact Person's Signature</i> Kathleen E. Diamond	<i>Date</i> April 4, 2010
<hr/> <i>Full-time Faculty's Signature</i> Tania Beliz, Theresa Martin, Carlene Tonini	<i>Date</i> April 4, 2010
<hr/> <i>Part-time Faculty's Signature</i>	<i>Date</i>
<hr/> <i>Administrator's Signature</i>	<i>Date</i>
<hr/> <i>Classified Staff Person's Signature</i>	<i>Date</i>
<hr/> <i>Student's Signature</i>	<i>Date</i>
<hr/> <i>Dean's Signature</i>	<i>Date</i>