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Instructional Program Review

Program Name: **Biology & Health Science**Program Contact: **Diamond, Kathy**Academic Year: **2013-2014**Status: **Submitted**

1. Description of Program

Provide a brief description of the program and how it supports the college's [College Mission and Diversity Statements](#), [Institutional Priorities, 2008-2013](#), [5 in 5 College Strategies, Spring 2011](#), and other [Institutional Program Planning](#) as appropriate.

The Biology department, including Health Science, offers courses serving a range of educational goals for students, including transfer to baccalaureate institutions for science and non-science majors, prerequisites for programs including nursing and medical assisting, and Health Science courses. Biology and Health Science courses are currently taught by seven full-time professors and seven adjunct instructors, supported by one full-time lab technician. One full-time faculty is retiring at the end of this semester (Spring 2014) and another will retire within one or two years. The department is in the process of hiring one full-time faculty for Fall 2014. Biology classes are conducted in lecture and lab classrooms on the second floor of building 36, with occasional lecture classes on the first or third floor and in building 18. For the academic year 2013-2014 the department offerings total 45 sections each semester of 18 (Fall) or 17 (Spring) different courses (including HSCI 100). Eight (Fall) or Nine (Spring) sections of lecture courses are offered online, and 6 sections of lab courses each semester are web-assisted (BIOL 210, 220, 260). Some courses are currently only offered online (BIOL 102, 145, 310), while some have both on-campus and online sections (BIOL 100, HSCI 100).

Online education is not a trivial undertaking. The Biology department takes its responsibilities to offer online courses of as high a standard as on-campus courses, whose academic quality faculty work constantly to maintain and improve, while striving to increase student success. Biology faculty and the Math-Science division play major roles in College training and development of online classes. Due to the popularity of online courses there is constant pressure to add more. Faculty recruit and volunteer for new training, mentoring and monitoring of first-time online instructors. Online courses of high quality demand a greater investment of time than one might casually expect. Biology faculty participate as STOT trainers, are on the Technology Committee, and will take on an investigation into larger online classes (XLOs) per a District initiative in Fall 2014.

Though Biology faculty have more weekly teaching hours than faculty in non-science departments they participate in national, state, district, and college committees. Biology faculty also participate in faculty inquiry groups, professional development activities that enhance teaching quality, innovation, interdisciplinary promotion of student success, all serving the college mission, especially addressing four Institutional Priorities: to improve the academic success of all students (including course completion, retention and persistence), to promote academic excellence (and improve transfer rates), to promote relevant, high-quality programs, and to enhance institutional dialog. In fact, Biology department faculty are at the forefront of several initiatives and projects that will improve faculty collaboration and teaching methods, promoting student perseverance, retention and success. Biology faculty both manage and work in two student learning support centers: the ISC (Integrated Science Center, 36-110) and the A&P (Anatomy and Physiology) Center, 36-217.

Biology faculty assess course SLOs, have aligned course SLOs to CSM General Education SLOs, established program SLOs, and this year wrote degree SLOs. Faculty have current course outlines approved by COI using CurricUNET, and has collaborated with Skyline and Canada college to establish common prerequisites for 200-level courses.

Biology faculty committee memberships include Academic Senate Governing Council (Biology faculty is Academic Senate Vice President), Basic Skills Initiative Support Committee, Learning Support Centers Coordinating Committee, Reading Apprenticeship Faculty Inquiry Groups, Math/Science Technology Committee, Committee on Instruction, College Safety Committee, College Sustainability Committee, SoTL (Center for the Scholarship of Teaching and Learning), District Performance Evaluation Task Force, District Distance Education Committee, and STOT I and II training.

Biology faculty continue to participate in the state-wide discussions leading to the development and implementation of the Associate of

Transfer degree in Biology AS-T, as mandated by SB1440. Biology faculty have also attended the Biotechnology All-Hands Meeting to discuss the Transfer Model Curriculum for Biotechnology. Faculty made minor adjustments in the majors' biology sequence this year to align Cell biology, General Botany, and General Zoology with the course descriptors of the state system (community colleges and California State University faculty).

The Biology department is a vibrant, positive, successful member of the College community, with healthy student enrollments and a faculty that constantly strives to meet the challenges to student success. Biology faculty are overworked but very productive in supporting Institutional Priorities. The most pressing issues for Biology are the needs for more full-time faculty, better temperature and door controls in building 36, and professional development opportunities and time.

2. Student Learning and Program Data

A. Discuss Student Learning Outcomes Assessment

Reflect on recent SLO assessment results for courses and degrees and certificates offered by the program. Identify trends and discuss areas in need of improvement.

Due to the nature of science courses, with frequent quantitative and objective in-class assessments of student learning (exams, quizzes and lab assignments), many Biology course SLOs are formally assessed in toto every three years. Thus trends may be observed in the classroom before they are reported as SLO assessment. Use of individually written lab exercises offered to students through WebAccess in lieu of commercial laboratory manuals provides for rapid turnaround between noting that students "didn't get it" and designing an improved teaching approach in both lecture and lab. For example, new and modified lab exercises have been introduced in Biology 110 and 230 in the past year, in response to students' struggles with SLO concepts.

Most Biology courses' SLOs were all assessed in either Fall 2012 or Spring 2013. Only a few Biology courses' assessments were due in 2013 but are still pending. One of these courses' SLOs are currently being revised and approved by the Committee on Instruction. The department has improved in performing SLO assessment of all SLOs for all Biology courses every three years.

Biology faculty established degree SLOs in the past year. Degree SLO assessment is performed by questionnaires prepared by the Office of Planning, Research, and Institutional Effectiveness (PRIE). SLO assessment results from Summer 2012-Spring 2013 were all 100% successful, though the number of respondents is small (4 for Biology AS Degree, 16 Biology: Pre-Nursing, 3 Biology: General).

B. Student Success Indicators

1. Review [Student Success and Core Program Indicators](#) and discuss any differences in student success indicators across demographic variables. Also refer to the [College Index](#) and other relevant sections of the [Educational Master Plan: Update, 2012](#), e.g., Student Outcomes and Student Outcomes: Transfer. Basic Skills programs should also refer to [ARCC](#) data.

Student success in Biology courses remains fairly constant: in 2010-2013 success averaged 65%, and retention averaged 80%. Biology success and retention are about 5 percentage points below the College values. Both on-campus and online courses in the sciences present somewhat greater challenges for students than non-science courses. This may be why success correlates with age, since maturity is an important "skill" needed for regular and productive study, key to success in the sciences. Biology faculty continue to pursue approaches that will improve student retention and success, both within the department and division, and with faculty in other disciplines. Of continuing concern is the difference among under-represented groups in Biology compared to the College. From 2010-2013 the percentage success of Black, Filipino and Hispanic students has fluctuated, and in 2012-2013 Filipino success was 5% higher than the College overall, though it was less in previous years. Black and Hispanic students currently have at least 10% lower success rate in Biology than the College overall. This is one reason Biology faculty participate in College committees and professional development activities that investigate ways to improve student achievement.

Biology faculty participate in the Community College Biology Faculty Enhancement through Scientific Teaching (CCB FEST) partnership with SFSU, the State Academic Senate STEM Academy, Leading From the Middle Academy, the Community College Success Network (3CSN) participation in the national Biology Vision and Change Initiative, and participation in AAC&U: Project Kaleidoscope, Ramping Up for STEM Success Initiative, and in the state-wide faculty discipline group developing the Biology Transfer Model Curriculum.

As a way to maintain the quality of our online offerings, the Biology department has an internal policy of requiring STOT or other recognized online training, plus mentoring by experienced distance education faculty. Given the challenges of online teaching, it is essential to have the same quality of instructors as in on-campus courses.

2. Discuss any differences in student success indicators across modes of delivery (on-campus versus distance education). Refer to [Delivery Mode Course Comparison](#).

Student success in biology Distance Education (online classes) has a short history of tracking. BIOL 100 and HSCI 100 are the courses offered both on-campus (Traditional) and online (Distance Ed) that have been tracked for three years. Fall 2012 BIOL 100 online had 67% success compared to 54% for on-campus, and 87% retention compared to 78%. Success as an average of three Fall semesters (2010-2012) was 63% compared to 49%, and retention 79% compared to 78%. For HSCI 100 Fall 2012 success was lower online than traditional, 55% compared to 58%, but the average of three Fall semesters was 59% online versus 55% on-campus. Retention was higher online for HSCI 100.

The ethnic profile of students taking online courses is about the same as in traditional versions of the same course (BIOL 100 and HSCI 100) but the total number of students in some ethnic groups enrolled in online sections is too small to offer a legitimate success and retention comparison with traditional courses. Because of the commitment to the success of all students these data will continue to be tracked. This is one reason Biology faculty participate in College committees and professional development activities that investigate ways to address student achievement.

C. Program Efficiency Indicators. Do we deliver programs efficiently given our resources?

Summarize trends in program efficiency as indicated in the [Student Success and Core Program Indicators](#) (LOAD, Full-time and Part-time FTEF, etc.)

Biology has very high efficiency, with a LOAD of 687 in 2012-2013 compared to the College LOAD of 533. In 2012-13 Biology percent full-time FTEF was higher than the College for the second time in two years: 64% compared to 59%. Even so, the department continues to struggle to staff high-demand distance education and traditional courses such as Anatomy with a shortage of qualified adjuncts and especially of full-time faculty. With the increasing involvement of Biology faculty in college and district initiatives in the coming year, the need for additional faculty is compounded.

The Biology department is fairly stable in "supply and demand," but is responsive to changes in student need, as well as changes in the College. Demand in some courses has been fluctuating over the past two years, impacting scheduling decisions. For example, enrollments have decreased in BIOL 240 and 260. In Summer 2014 the department will not offer BIOL 240, and in Fall 2014 will offer one less section of BIOL 260, to improve enrollments in each course. Enrollments have increased in BIOL 110 and 310. BIOL 110 and 310 serve both general education and major requirements for some transfer programs. The number of online BIOL 310 sections has been increased every semester, and BIOL 110 has added a section Spring 2014 and will add one Fall 2014 as well. Both courses fill all sections easily and can probably fill more sections if they can be staffed.

The table below compares the number and types of sections of Biology courses offered between Fall 2009 and (scheduled for) Fall 2014, reflecting changing requirements and student need. If not specified the class is traditional (on-campus). Some courses are only offered in Spring semester, so not all comparisons are shown. For example, BIO 102 changed from one section on campus to one online section Spring 2014, and BIO 310 increased to four online sections Spring 2014.

Course	# sections Fall 2009	# sections Fall 2014
BIOL 100	6 on campus + 1 online	4 on campus + 2 online
BIOL 110	7	8
BIOL 123	1	1
BIOL 126, 127, 128	2	3

BIOL 130	2 on campus + 1 online	2 on campus + 1 online
BIOL 145	1 online	1 online
BIOL 184	1	1
BIOL 195	1	1
BIOL 210	1	2 webassisted
BIOL 220	1	1 webassisted
BIOL 230	1	1
BIOL 240	4	3
BIOL 250	6	6
BIOL 260	3	2 webassisted
BIOL 310	0	3 online
BIOL 329	0	1 new name IDST 102, 104
HSC 100	7 on campus (incl. 1 coastside) + 1 TV + 1 online	1 on campus + 2 online

Biology, Physics and Chemistry departments have coordinated scheduling of Biology major courses so that students will have stable scheduling over several years, and in a way that students can take all of their classes efficiently. Bio majors take a biology and a chemistry class each semester, plus physics and math, in addition to general education classes. With a limited number of sections in these specialize classes, coordination with chemistry, physics, and math is essential for students to complete their transfer requirements efficiently to transfer successfully.

Demand for online courses continues to grow, with every added section filling early. More faculty are learning to teach online courses through district courses (STOT I and II) and approved external courses plus mentoring by experienced Biology faculty, some of whom teach for STOT training. The online biology teachers are meeting the challenges of retention and success that set online classes apart from traditional courses. The Biology department maintains academic standards by requiring training and mentoring of prospective online instructors.

Percentage of full-time classroom teaching FTEF in Biology decreased slightly from 2011/20102 to 2012/2013 from 66% to 64%, while the College also decreased 2% points, from 61% to 59%. More full-time faculty are needed to achieve college goals of student success, academic excellence and high-quality programs, as well as institutional dialog. In Fall 2014-Spring 2015 two full-time Biology faculty will each have 50% release time to work on a District initiative on Distance Education. An adjunct will serve as project manager and the Biology department will have one temporary full-time position, which will be filled by a current adjunct instructor.

3. Additional Factors

Discuss additional factors as applicable that impact the program, including changes in student populations, state-wide initiatives, transfer requirements, advisory committee recommendations, legal mandates, workforce development and employment opportunities, community needs. See [Institutional Research](#) as needed.

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1. Articulation

Transfer Model Curriculum Course Descriptors have impacted Biology courses in minor ways, and faculty have rewritten course outlines to bring Biology courses into alignment with the anticipated final state descriptors. Changes have included prerequisite or recommended preparation modifications (e.g. eligibility for ENG 100 instead of ENG 848), minor course content additions (e.g. adding Mendelian genetics to BIOL 230 although it is also covered in BIOL 210 and 220). Once implementation of SB 1440 is complete, the Biology department expects students pursuing transfer to the State University system will have a more transparent path. A more strict accounting on the number of units students take before transferring, and a clear listing of chemistry, biology, physics, math, and GE classes students must complete before transferring should expedite transfer readiness as long as students can be accepted to their desired CSU campus. Students pursuing transfer possibilities to the UC system will still have to use ASSIST (assist.org) for more guidance since transfer requirements vary between UCs and programs/majors. Student transfer agreements with UC campuses will not be affected by the implementation of SB1440.

At CSM the Biology courses are strongly articulated with UCs, CSUs, and private universities. As soon as the Biology AS-T is finalized, CSM Biology courses will be submitted for approval. Transfer Model Curriculum Course Descriptors for Anatomy and Physiology are being developed in two tracks. One track would not require any science prerequisite for the courses, while the other track would have science prerequisites. Currently both Biology 250 and Biology 260 at CSM have science prerequisites. The descriptor draft also requires 80% of the labs be hands-on labs. While this is not an issue for the Anatomy course, Physiology is currently taught as web-assisted with 50% of the lab being taught online. This model may have to be revisited as the descriptor becomes final.

Bio 220 (botany) and Bio 210 (zoology) are only offered at CSM. Revising and submitting our course outlines for COI approval will be straightforward.

A recent articulation issue has developed with San Jose State, an important transfer institution for College of San Mateo students. BIOL130 (Human Biology) will no longer articulate because it lacks a lab. The department is in the process of developing a one-unit laboratory course for Human Biology, BIOL 132. The course outline will be submitted for approval in Fall 2014 and the class offered in Spring 2015. This lab will be of use to students for general education as well as pre-health preparation. BIOL 132 will be taken concurrently with BIOL 130 or after its completion.

The Biology Department has entered into an NIH-funded Bridges to the Baccalaureate Program partnership with SFSU. The Bridges program seeks to increase the number of CSM students from underrepresented groups who earn a baccalaureate degree in a biomedical science field. One of the components of the program is a seminar series at CSM, to raise awareness and interest in the biomedical sciences.

2. Honors Project

The Honors Seminar class is being offered under a Biology listing (BIOL 329) for the first time Spring 2014. Beginning in Fall 2014, the honors science seminar will be offered as an Interdisciplinary course. The mission of the Honors Project at CSM is to provide opportunities of engagement for students who are among the most academically motivated. The seminar course is paired with a transferrable science, technology, engineering or math course, called the "foundation course." Participating students are expected to expand on and deepen the content of their foundation course by developing a project under the theme of the seminar course. The seminar course provides students with a means to make intellectual connections between their own interests and a range of disciplines through the aim of a scholarly dialogue with one another and their professors. The students are provided with the opportunity to present their Science Honors Research Project at the CSM Honors Project Showcase.

There are six students enrolled in the BIOL 329 Honors Science Seminar Spring 2014. Three students are using a biology course as their foundation course, two students are using a chemistry foundation course and one is using a psychology course.

3. Reading Apprenticeship

The Reading Apprenticeship Program (RA) is a powerful initiative that addresses the College Institutional Priorities, including five of the six proposed revised priorities for 2014: Improve student success (especially improving progression through courses and increasing student engagement); Promote Academic Excellence; Develop Responsive High-Quality Programs; Support Professional Development; Enhance Institutional Dialog.

The Educational Master Plan data expose the gaps in student achievement. The Reading Apprenticeship initiative attempts to close those

gaps by addressing the fundamental skill of reading across the campus. By training faculty and staff who work directly with students to provide reading assistance, our students will come to use the dialogue about reading and learning as an intrinsic part of their academic identity. Biology faculty have been major leaders in the RA initiative in the department, the Math/Science division and across campus, in flex day workshops and RA luncheon events.

The use of Reading Apprenticeship (RA) in Biology classes has expanded from 6 sections since Fall of 2012 to 12 sections in Spring 2014. The seven RA instructors currently practicing RA have monthly RA FIG (Focused Inquiry Group) sessions in which they share practices and discuss accomplishments and challenges. Overall RA faculty notice increased engagement in their classes, better group work, and a better focus on the text as a resource. 81% of students in RA classes surveyed reported the the reading strategies improve their success in the course (n = 522, RA Student Survey Results Fall 2013). While student success has not yet shown an improvement it is early in the introduction of RA techniques in classes, and instructors find they add more RA exercises as they become more experienced with the techniques themselves. Campus-wide meetings and continued training are key to increased infusion of RA into classes. One Biology 110 instructor has compared the success, retention and grades of classes before RA and in the first year of introduction. While success and retention rates did not show significant change, the proportion of students who earned A or B grades increased compared to the proportion who earned C grades: (Fall 2011 + Spring 2012: 36% A + B, 35% C; Fall 2012 + Spring 2013: 46% A + B, 22% C). This suggests that students who were just "getting by" became more engaged and more skilled at academic achievement.

The IPBC (Institutional Planning and Budget Committee) has requested a proposal for institutionalization of RA, which was presented in February, 2014. SoTL (Center for Scholarship of Teaching and Learning) is supporting RA for spring 2014 semester with funding for training, workshop preparation and materials, and evaluation. The RA luncheon and student panel held on October 25th, 2013 was very successful. 35 faculty and staff attended. Students gave moving testimonials about the power of RA in their academic lives. The panel was videotaped and a highlight video is available. To date, 66 CSM Faculty, faculty, staff, and administrators have received RA training from either 3CSN/WestEd or CSM workshops. There were 44 confirmed Fall 2013 sections where RA instruction occurred, including the tutor-training classes in the Learning Center. We estimate approximately 1000 students received RA instruction in Fall 2013. Biology faculty are major participants and presenters in all of the RA activities.

To contribute to the expansion of Reading Apprenticeship (RA) at CSM two biology faculty and an administrator participated in the Basic Skills Initiative Leadership Institute, BSILI (3CSN), summer 2013. The RA-BSILI team also participated in the Student Success Conference (October 2013), and in the Data Inquiry Group, DIG, workshop (January 2014). A CSM Co-division panel discussion was videotaped and used at other California Community Colleges to promote RA at their campus. RA, Habits of Mind, and the California Acceleration Project (Math and English Acceleration) are 3CSN Communities of Practice.

4. Online courses

HSC 100 (General Health Science) is no longer a requirement for AA degrees, but remains in fairly high demand, especially the online (distance education) sections. Online HSC 100 is one of two courses in the Math/Science Division that will be used to investigate a new model for online course delivery, with the intention of increasing enrollment and improving effective instructor-to-student contact. Financial support from the SMCCCD Chancellor's office will be used to train student tutors/assistants and to support the production of accessible high quality content videos. The chancellor's support will also cover costs, including: 50% reassigned time Fall 2014 and Spring 2015 for two full-time biology instructors; the cost of one adjunct faculty to be hired in a temporary full-time capacity to cover some full-timers' courses; a project manager to keep development of the new model online HSC 100 on track. The new model online HSC 100 class will offered for the first time in spring 2015.

5. Classroom limitations

The department has limits in course scheduling due to the lack of lecture and lab classrooms in building 36. This is especially true in high demand courses with dedicated classrooms. For example, since moving into building 36 the department has dedicated the shared Anatomy-Physiology lab (36-217) to Anatomy Monday-Wednesday-Friday and to Physiology Tuesday-Thursday. This makes lab set-up, equipment placement, and other material preparations more efficient and promotes better care of such equipment, especially models. However, since the introduction of the A&P Center, which is open lab hours for students and uses the same lab classroom, anatomy faculty have been experiencing difficulty preparing for lab practicums and offering open lab hours to night students because of the heavy MWF schedule for room 217. With all the Bio 250 classes running on those three days, we are limited in offering open lab before classes on Monday and Wednesday. Faculty need to explore the idea of rearranging Bio 250 sections and 260 sections so that there is at least one open hour in the lab before each Bio 250 class. This type of coordination emphasizes the high degree of cooperation needed for all faculty teaching Anatomy and Physiology, and is another strong reason for having more full-time faculty in the department, especially for Anatomy.

A. Results of Program Plans and Actions

Describe results, including measurable outcomes, from plans and actions in recent program reviews.

Biology is a diverse field of study, and instructors generally specialize in a few different courses, rather than the entire range of offerings of the department. Adjuncts' loads are usually maximized, and though adjuncts have high regard for the College, they will take a course in a more convenient location when it is offered (and of course a full-time position elsewhere). The Biology department is in the process of hiring a full-time faculty for Fall 2014 with the ability to teach Anatomy and at least one other Biology course. This will be a positive step for the department, although the need is very strong for two Anatomy positions at this time, since the department will still be short full-time instructors in Anatomy and another Anatomy/Physiology professor will retire in the next year or two.

More faculty are needed to teach online courses, and there has been an increase in training of current adjuncts. One more online section was added each semester 2013-2014 and additional online sections were added Summer 2013. (In Spring 2014 there were 10 online + 6 web-assisted Biology or Health Science sections). Current online biology instructors are meeting the challenges of retention and success that set online classes apart from traditional courses. The Biology department's policy for staffing online classes that incorporates a requirement for training and mentoring of prospective online instructors allows assignment of instructors to online courses with confidence in the quality of the course.

Biology faculty have responded to the college's documented need for enhancement of student success by becoming very active in initiatives directly promoting student success. Faculty have taken a proactive role to improve student achievement, especially through in-depth development of Reading Apprenticeship skills, using campus workshops, online courses, summer courses, Focused Inquiry Groups, as leaders and learners. Three full-time faculty and four adjuncts have implemented Reading Apprenticeship practices as regular parts of some or all of their Biology classes. Biology faculty provide leadership in the Integrated Science Center and A & P Center, and are active participants in the Learning Support Center Coordinating Committee, CCBFEST workshops, and numerous other initiatives to promote student success. The department has led efforts to adopt the 3CSN sponsored Reading Apprenticeship Program across the campus, and one faculty member is the campus coordinator of Professional Enrichment through the Academic Senate.

Since Spring 2013 Program Review the department was able to purchase all requested equipment, including anatomy models and microscope slides to replace or improve slide sets for Biology 110, 210 and 250. Recent additions to the department have included new microscopes in Microbiology (BIOL 240), and computers for Biology classroom use.

B. Program Vision

What is the program's *vision* for sustaining and improving student learning and success over the next three years? Make connections to the [College Mission and Diversity Statements](#), [Institutional Priorities, 2008-2013](#), and other [Institutional Program Planning](#) as appropriate. Address discussion in the Student Learning and Program Data section: SLO assessment results and trends in student success indicators. **[Note:** Specific plans to be implemented in the next year should be entered in C of the Planning section.

CTE programs must address changes in the context of completion and employment rates, anticipated labor demand, and any overlap with similar programs in the area as noted in D1 and D2 of the Career Technical Education section.]

Full-time, dedicated Biology faculty are the most vital element in the Biology department's commitment to fulfill the College Mission and Institutional Priorities, notably five of the six proposed revised priorities for 2014: Improve student success (especially improving progression through courses and increasing student engagement); Promote Academic Excellence; Develop Responsive High-Quality Programs; Support Professional Development; Enhance Institutional Dialog. The Biology department is deeply invested in learning and applying techniques that can stimulate student engagement in each Biology course, leading to higher levels and rates of successful course completion for all demographic groups. The proportion of the faculty who participate in college committees and initiatives to improve student success, which has been high and yet has increased over the past year, will continue to grow. Outside classroom hours devoted to professional development and curriculum enhancement that contribute to the same goals, also already high, will also grow. For continuing ambitious and productive work and departmental, divisional and College-impacting goals the Biology department requires more full-time faculty, more professional development support, and more than

24 hours in a day (unfortunately evidence has been accumulating that the last need cannot ever be met).

Accreditation requirements for SLO assessment, state mandated collaboration on transfer model curriculum planning, and other institutional requirements are best, and often only, met by full-time faculty contributing to these efforts outside of classroom hours. Adjunct faculty

usually lack campus time or commitment for this extra work.

The department is fortunate to have some adjuncts who are willing to give their time outside of classroom work and in spite of their lack of full-time employment at CSM, but most adjuncts cannot or will not make this sacrifice, and those who do are very desirable hires when other institutions have full-time positions open. The department needs to be able to offer such valuable faculty full-time positions so they may thrive and the College may benefit from their dedication.

Biology success and retention is about 5 percentage points below the College values. Of special concern is the difference among under-represented groups in Biology compared to the College. While age is a factor, Black and Hispanic students have at least 10% lower success and retention in Biology than the College overall. Thus Biology faculty continue to participate in College committees and professional development activities that investigate, test, establish and institutionalize teaching and learning methods that improve student achievement. This includes a long-term commitment to Reading Apprenticeship training and applications and related formal and informal faculty inquiry groups that stimulate implementation of productive pedagogical techniques, transformation of the classroom and learning environment, and enhanced interest in the scholarship of education.

The Biology department is committed to continued and increasing pursuit of excellence and offerings in online sections of courses as appropriate. The number of online sections will increase according to demand as long as skilled faculty are available to teach them. The investigation into XLO (extra large online courses) undertaken in Fall 2014 by Biology faculty supported by the Chancellor's office will provide a way of determining if this is a feasible and affordable approach to the demand for such classes.

1. To guide future faculty and staff development initiatives, describe the professional activities that would be most effective in carrying out the program's vision to improve student learning and success.

Biology faculty have found inspiration and stimulation from working with colleagues in other disciplines as well as fellow Biologists. Continued support for Reading Apprenticeship training, on and off campus, will have an increasing impact on student success. Several Biology faculty attended 3CSN Leadership Community of Practice Institute summer 2013 with a Reading instructor and Director of the College Learning Center. Since then these faculty have led Reading Apprenticeship workshops at CSM on flex day and luncheon events several times over the academic year 2013-2014. These events provide interdisciplinary discussion and practice, and promote communication between all faculty. They have included student participation in panels, relating their experiences with Reading Apprenticeship in their classes, and more faculty have taken part in online RA courses. The faculty have also presented at RA workshops on other college campuses, sharing their experiences and growing expertise.

Continued funding is desirable for conferences that help improve success and retention of STEM students, and further train faculty to implement Reading Apprenticeship in science classes. Examples of professional development activities are:

- Online teaching and learning conferences for advanced level training beyond that offered by STOT I and II.
- Participation in STEM related conferences similar to the February 2013, STEM Academy sponsored by the State Academic Senate.
- Participation in Reading Apprenticeship workshops.
- Participation in Vision and Change Initiatives
- Participation in CCBFEST.
- Participation in Project Kaleidoscope professional development and initiatives
- Leadership training and/or grant writing training in order to create STEM success initiatives with external funding

Networking and participation in community college leadership groups such as State Academic Senate, 3CSN, WestEd, RP Group

2. To guide future collaboration across student services, learning support centers, and instructional programs, describe the interactions that would help the program to improve student success.

The department faculty will continue to work on and expand upon collaborative efforts with the other learning support centers. Alignment of services, and a shared vision for these services helps promote a culture of integrated service for students. Further collaboration with student services to help students receive non-academic support would also enhance student success. We are enjoying the dialogue that RA inquiry has generated across instructional programs, and we hope to continue and expand that dialogue to include reading, writing, quantitative skills, and other nonacademic skills such as growth mindset, interpersonal communication, time management, etc.

Therefore Biology faculty will continue their membership in the Learning Support Centers Coordination Committee, including participating in decisions about the Learning Center's functions, and mentoring and collaboration with LC staff in RA FIG (Reading Apprenticeship Focused Inquiry Group). Biology faculty donating time to manage academic aspects of the ISC, particularly accreditation-required assessment

increases, will need to be replaced by paid adjunct hours, or the assessment work and program review will not be complete. A&P center faculty will promote faculty staffing and support for more paid hours.

3. To guide the **Institutional Planning Budget Committee** (IPBC) in long-range planning, identify any major changes in resource needs anticipated during the next three years. Examples: faculty retirements, equipment obsolescence, space allocation.

See the Resource Requests section below to enter itemized resource requests for next year.

Leave sections blank if no major changes are anticipated.

Faculty

One Biology faculty is retiring at the end of Spring 2014 and another faculty is expected to retire in 2015 or 2016. This year's retirement is a General Biology (BIOL 110) faculty and the other is an Anatomy and Physiology instructor. While the department will be hiring one Anatomy full-timer for Fall 2014, a second full-time position has been requested for several years, and is still needed. With the extra non-classroom work that several full-time faculty are engaged in, for which they have or will have release times of 25-50% or greater, it is even more important to make up the existing shortage of full-time faculty. The ISC needs the equivalent of 25% adjunct pay for academic management, including participation in LSC3 meetings, program review research and preparation, assessment of SLOs Fall and Spring semesters, and additional assessment methods as requested by the Student Support Division, as recommended in accreditation.

Equipment and Technology

Continued technological support is needed to improve online course materials.

Instructional Materials

The department needs anatomy models, eventual cadaver replacement, camera for live projection of cadaver dissection and demonstrations, expand clicker use and increased provision for loaners by division.

Classified Staff

The ISC is in need of funding for a 25% staff (instructional aide) to help manage the ISC and provide assistance during peak use times by students. Currently there are times when the ISC is not open due to shortage in staffing.

Facilities

Maintenance and replacement of classrooms items including seating, lighting, projector bulbs, shades. General environmental controls--temperature and humidity--are still a major problem in B36. Classroom and lab room doors slam with great deal of noise, interrupting class when students come and go into rooms. Safety and security improvements: electronic locks on lecture rooms; ability to lock doors from inside. In case of a lock down, faculty are not able to lock the classrooms or lab rooms from the inside of the room. Phones in the classrooms and lab rooms were requested in the original building construction requisitions as an important safety feature in case of emergency. During fire and lock down drills, there is no way to hear an alarm inside of classrooms or lab rooms. This is of particular concern in case of a fire; students and faculty could be trapped inside rooms if there is no floor monitor to alert them. Another concern, for security and fire-safety reasons, is that the building's outside doors often do not close completely. It would be of great value to have a general assessment of building 36 security conducted.

Long-term commitment to maintenance of teaching gardens is of critical importance to many biology classes. The teaching gardens on the East side of building 36 are used by several classes: Bio 102, 110, 195, 210, and 220. The gardens are the only mature habitat left on campus. The gardens have a variety of mature plant specimens representing many phyla and plant families. Some of the specimens are rare, and seeds or plants are not available for replacement. Students are able to conduct observations and studies of pollinators, birds, and plant morphology, phenology (seasonal cycles), and life cycles, in addition to data collection, in the safety of the campus gardens. The

teaching gardens are also a source of botanical specimens for biology classes (branches, leaves, flowers, fruits, etc.).

C. Program Plans and Actions to Improve Student Success

Prioritize the plans to be carried out next year to sustain and improve student success. Briefly describe each plan and how it supports the **Institutional Priorities, 2008-2013**. For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

The most pressing issues for Biology are the needs for more full-time faculty, attention to the physical problems of building 36 (especially temperature and door controls), and professional development opportunities.

Plan 1

Title:		
Hire second new Full-time Anatomy Faculty		
Description		
<p>The department is understaffed, and is in the process hiring one Anatomy instructor (with ability to teach one other Biology course). This will still leave the department short-handed, and several full-time faculty have 25-50% release time in the next one-three years. Another Anatomy instructor will retire in 2015 or 2016. Thus the need for full-time faculty will not be met by a single hire for Fall 2014.</p> <p>Biology is a diverse field of study, and instructors generally specialize in a few different courses, rather than the entire range of offerings of the department. Adjuncts' loads are usually maximized, and though adjuncts have high regard for the College, they will take a course in a more convenient location when it is offered (and of course a full-time position elsewhere).</p> <p>Anatomy is an impacted course that is taken primarily by students preparing for allied health programs, especially nursing and physical therapy. Anatomy has enacted a number of initiatives to promote student success and retention, including providing the faculty staffed A&P Center, introducing the Reading Apprenticeship program, maintaining an anatomy website. An additional committed full-time faculty is necessary to continue the development and expansion of these initiatives to promote student success.</p>		
Action(s)	Completion Date	Measurable Outcome(s)
Hire full-time Anatomy instructor	2014-2015	Improve retention and success in Anatomy classes; improve readiness of nursing students; contribute to other Biology courses and department work.

Plan 2

Title:		
Building 36 temperature regulation and door security		
Description		
<p>The temperature of lecture rooms, lab rooms and the hallways of building 36 varies seemingly randomly from floor to floor, day to day and week to week. Extremes of hot and cold are common all year round, unrelated to outside temperature. The</p>		

outside building doors often do not close because of strong air currents blowing through the halls. Lecture room doors do not have electronic locks, and none of the classroom doors can be locked from inside. Together these are health and security issues that should be fixed for once and for all. The importance of this problem does not seem to be recognized by the college, and there does not seem to be any interest in or ability to improve the function of building 36.

Action(s)	Completion Date	Measurable Outcome(s)
Pursue answers and solutions to the problems of temperature control.	2014	Reliable moderate temperatures in all rooms throughout the building
Pursue funding and planning for electronic locks on lecture rooms and for inside locking mechanisms	2014	Safety drills will show that classrooms may be safely locked without faculty exiting the rooms

Plan 3

Title:
25% pay for adjunct faculty to manage academic aspects of ISC
Description
The ISC needs equivalent of 25% adjunct pay for academic management, including attendance at Learning Support Centers Coordination Committee meetings, program review research and preparation, assessment of SLOs Fall and Spring semesters, and additional assessment methods as requested by the Student Support Division, as recommended in accreditation.

Action(s)	Completion Date	Measurable Outcome(s)
Identify and pay adjunct faculty to work non-classroom hours on academic aspects of ISC management	2014-2015	Improved student services in ISC; compliance with accreditation requirements for SLO assessments and other forms of assessment of learning support centers.

Plan 4

Title:
Reading Apprenticeship expansion and institutionalization plus other professional development funding and opportunities
Description
The Reading Apprenticeship (RA) Program is a professional development program sponsored by the California Community College Success Network (3CSN). The 3CSN organization trains and supports faculty in initiatives that have been shown to enhance student success. Reading apprenticeship is a classroom intervention that is done by faculty in different disciplines in order to enhance the reading skills of students in their discipline. For the instructor, RA offers a support network of professionals who are also using RA in their classes. CSM faculty have been to training workshops, and have formed a Faculty Inquiry Group (FIG) that meets regularly during the semester to discuss the pedagogy and best practices. In addition, 3CSN supports outcomes research around the pedagogy. CSM faculty are assessing their practice and the effects on student success in a recursive way, so that future efforts can be improved.

Additional professional development activities for full-time and part-time faculty, including enhancing online curriculum development, interdepartmental and interdisciplinary communication and collaboration especially related to improving success and transfer rates of underrepresented students. Most of the biology faculty, including full-time and part-time, utilizes the District's WebAccess course management system to some extent from posting course material to fully online courses. Continued training in online teaching and emerging technologies is necessary to help the faculty improve student success through the use of these technologies.

Action(s)	Completion Date	Measurable Outcome(s)
Continued participation in FIG, professional development activities including attending workshops, giving presentations and mentoring College faculty	2014-2015	Increase in RA activities in Biology and non-Biology classes, achievement of higher retention and success rates
Participation in other professional development activities and FIGs	2014-2015	Achievement of higher retention and success rates of underrepresented students

Plan 5

Title:
A&P center pay for faculty staffing

Action(s)	Completion Date	Measurable Outcome(s)
Pursue sources of funds to pay for more faculty hours in the A&P Center	Choose Year or Semester/Year	Increased hours available to students results in higher rates of retention and success in Anatomy and Physiology

5. Resource Requests

Itemized Resource Requests

List the resources needed for ongoing program operation.

Faculty

NOTE: To make a faculty position request, complete [Full-time Faculty Position Request Form, AY 2013-2014](#) and email to your Dean. This request is separate from the program review.

Full-time faculty requests	Number of positions
Anatomy and one other Biology field: General Biology, Microbiology, Physiology, Cell Biology, or Zoology	1

Adjunct faculty hours to manage ISC

Tab to add rows

Equipment and Technology

Instructional Material

Description	Cost
Altay Skeletal Muscle Fiber Moder #567425	246.95
Altay Microstructure of Cardiac Muscle Model #567429	179.95
Altay Microstructure of Smooth Muscle Model #567427	212.50
Altay Human Heart Model #566903A	64.50
Altay Giant Heart Model, 4 Parts #566813	262.00

Classified Staff

Facilities

For immediate or routine facilities requests, submit a [CSM Facility Project Request Form](#).

Description (for prioritized plans)	Plan # #(s)	Cost
Building 36 temperature regulation and door security	2	tbd by Facilities

6. Program Maintenance

A. Course Outline Updates

Review the [course outline update record](#). List the courses that will be updated in the next academic year. For each course that will be updated, provide a faculty contact and the planned submission month. See the [Committee on Instruction website](#) for [course submission instructions](#). Contact your division's [COI representatives](#) if you have questions about submission deadlines.

Career and Technical Education courses must be updated every two years.

This year BIOL 110, 130, 145, 184, 230 outlines were updated and approved by COI. The minor changes made to course outlines included edited SLOs, removal of TBA hours, or content adjustments in response to or anticipation of alignment with State Transfer Model Curriculum requirements. It should be noted that the list of course outlines' dates on the College Articulation website is not up to date. The

College Articulation website does not list the latest course outlines and dates for all Biology courses. Biology course outlines are up to date.

B. Website Review

Review the program's website(s) annually and update as needed.

Faculty contact(s)	Date of next review/update
Theresa Martin	Fall 2014

C. SLO Assessment Contacts

Faculty contact(s)	Date of next review/update
Biology 130 faculty	2014 Spring
Biology 260 Carlene Tonini	2014 Spring