College of San Mateo — Program Review Submission

Learning Support Centers Program Review

Program Name: **CIS Computer Center**
Program Contact: **Green, Melissa**
Academic Year: **2013-2014**
Status: **Submitted**

1. Description of Center

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 CIS Computer Center is located in building 19, rooms 124 and 126. Computer Center hours are

Monday - Thursday	8:30 am - 8 pm
Friday	8:30 am - 2 pm
Saturday/Sunday	Closed

The purpose of the CIS Computer Center is to help CSM students of all backgrounds succeed in their courses. The CIS lab hosts regularly-scheduled lab sessions for many CIS courses, and provides support to students enrolled in CIS, Architecture, Drafting, and Engineering courses. In addition, the lab is available so that students enrolled in these courses can complete their assignments and/or their required hour(s) by arrangement. CIS students can improve their programming and other skills during scheduled, instructor-led lab sessions. This helps to reinforce material introduced in lecture and allows the opportunity for instructors to ensure that students meet SLOs. CIS, Architecture, Drafting, and Engineering students use specialized software to complete their assignments and/or fulfill their hour by arrangement.

The CIS Computer Center is available to all CSM students, but priority is given to CIS, Architecture, Drafting, and Engineering students. Four CIS courses, some with multiple sections, have regularly-scheduled lab sessions in the CIS Computer Center, while an additional twenty-two CIS courses use the Computer Center. Two Architecture, four Drafting, and three Engineering courses use the Computer Center on an occasional or regular basis. All CSM students may use the CIS Computer Center, but only students with an account have printing privileges (with a limit of 10 pages). Accounts are created for CIS, Architecture, Drafting, and Engineering students. The CIS Computer Center is used by the Nursing program for online exams several times per semester. Business students also use the CIS Computer Center.

By offering this resource and by measuring student learning outcomes, the CIS Computer Center of College of San Mateo serves to improve retention in CIS as well as other courses.

The CIS Computer Center is a vital resource for the students and faculty in this department. Faculty members frequently teach in the lab on a regular basis, as many of the CIS (and Engineering) courses have lab components. In addition, CIS (as well as Drafting, Engineering, and Architecture) students use the center to work on projects and homework in an environment where they can frequently interact with faculty or the instructional aide for assistance.

2. Student Learning and Center Data

A. Discuss Student Learning Outcomes Assessment

Reflect on recent SLO assessment results for courses and degrees and certificates offered by the program.

CIS 110 Individual SLOs' Results and Assessment

SLO 01: *Articulate a general understanding of computers and digital basics.*
Students performed at a 78% level on this assignment. This includes 16% of the students who did not turn in the assignment. This is an early assignment and many students do not yet have their text.

SLO 04: *Select equipment and processes for building a wired or wireless network.*
This assignment is enjoyed by most students and consequently they performed at a 94% level. This includes 8% of the students who did not turn in the assignment.

SLO 05: *Demonstrate effective use of the Internet and World Wide Web.*
Students performed at an 88% level on this assignment. This includes 11% of the students who did not turn in the assignment.

SLO 06: *Recognize, create, and manipulate digital media.*
This assignment is enjoyed by most students and consequently they performed at a 94% level. This includes 8% of the students who did not turn in the assignment.

110 ASSESSMENT: Evidence shows that those students who read the chapter and complete the labs are nearly 100% successful in accomplishing the student learning outcome(s). This suggests the instructional materials and teaching methodology are sound. What appears to be a problem is getting all students to engage in class assignments. This said, CIS 110, overall success rate is increasing and the online performance matches that of the face-to-face sections. One issue that continues to be troublesome is that more and more students are using MACs for this course. The text and the course material is more geared toward the PC, but to assist MAC using students, it would be helpful for faculty to have a MAC.

SLOs found in the first two weeks of the course are difficult to assess. Many students do not yet have their textbooks. It is a very unfortunate situation that Vets and financial aid students cannot get their books more readily. The instructors will continue to make copies available in the Learning Center and Library, but some course materials cannot be provided such as assess to the publisher's website.

CIS 114 Individual SLOs' Results and Assessment

SLO 1: Develop interactive Web applications that integrate HTML with JavaScript using event handlers. 100% of the students completing the assignment met the criterion.

SLO 2: Explain object-based programming and the Document Object Model (DOM). 84.6% of the students answering the exam question met the criterion.

SLO 3: Create JavaScript applications that use cookies to track and save Web preferences. 92.3% of the students completing this midterm exam program met the criterion.

SLO 4: Develop interactive Web applications that integrate client- and server-side programming using JavaScript and a server-side language. 100% of the students completing the assignment met the criterion.

SLO 5: Employ XMLHttpRequest to fetch XML, RSS, or JSON data asynchronously from the server. 100% of the students completing the assignment met the criterion.

SLO 6: Explain Ajax design patterns and illustrate how they are used to create various Ajax applications. 93.75% of the students answering the exam question met the criterion.

SLO 7: Create an advanced project using the various Ajax technologies, with attention to security and performance. 100% of the students completing the assignment met the criterion.

114 ASSESSMENT: Students who participate in this online class succeed. Students who do not participate do not succeed. Most students are working fulltime. CSM counselors have finally stopped incorrectly advising students to take CIS 114 without the recommended preparation, so there was only one unprepared student enrolled in fall 2013. All SLO results are the same or better than previous semesters. Now that the instructor has a Mac laptop, students using Macs are currently supported.

The majority of students who drop or withdraw from the class are conscientious A or B students who, for personal reasons, feel they no longer have adequate time to devote to the coursework. A minority of students feel that they have purchased the course material by registering, and will continue to log into WebAccess without doing any of the required work or taking any tests or exams. They often state that they don't mind getting a grade of F or NP. If dropped from the class they often insist on reinstatement, complaining to the registrar and/or the dean. This negatively impacts the success rate.

CIS 255 Individual SLOs' Results and Assessment (Instructor 1)

SLO 01: Analyze and explain the behavior of programs involving the fundamental program constructs. 86.6% of the students answering the test question met the criterion.

SLO 02: Write short programs that use the fundamental program constructs including standard conditional and iterative control structures. 100% of the students completing the lab met the criterion.

SLO 03: Identify and correct syntax and logic errors in short programs. 100% of the students completing the lab met the criterion.

SLO 04: Write short programs using arrays. 100% of the students completing the lab met the criterion.

SLO 05: Design and implement a class based on attributes and behaviors of objects. 100% of the students completing the lab met the criterion.

SLO 06: Construct objects using a class and activate methods on them. 100% of the students completing the lab met the criterion.

SLO 07: Use static and instance members of a class properly. 80% of the students completing the final exam program met the criterion.

SLO 08: Identify and describe value, scope and lifetime of a variable. 84.8% of the students answering the test question met the criterion.

SLO 09: Describe the parameter passing mechanisms and method overloading. 84.8% of the students answering the test question met the criterion.

SLO 10: Analyze and explain is-a relationships among objects using a class hierarchy and inheritance. 100% of the students completing the lab met the criterion.

255 ASSESSMENT: Absenteeism is the predominant factor leading to non-success in CIS 255. Because the class is a hybrid class that meets for three hours of lecture once a week, missing even a single class results in missing an entire week's lecture. It can be difficult for students to make up missing material. The lab portion is completed online. Students who regularly attend lecture generally succeed, meeting all SLOs. More than half of enrolled students are working full-time.

CIS 255 Individual SLOs' Results and Assessment (Instructor 2)

SLO 01: Demonstrate understanding of the principal object-oriented programming concepts. 90% of students answered these test questions correctly.

SLO 02: Employ Unified Modeling Language (UML) notation to model the object-oriented design of a non-trivial computer program. 97.4% of the students completing the assignment met the criterion.

SLO 03: Implement a medium-size computer program that is stylistically and functionally correct, based on an object-oriented design model. 80.3% was the average grade of students completing this assignment.

SLO 04: Reuse existing components through inheritance and polymorphism. Students writing this program on a test had an 85% success rate.

SLO 05: Implement, test and debug simple recursive functions. Students had an 82.7% average on this assignment.

SLO 06: Understand and employ basic sorting and searching algorithms. The average grade on this assignment was 80.3%. The final exam question had an 80% success rate.

SLO 07: Perform exception handling. The average grade on this assignment was 80.3%

SLO 08: Use and create standard API documentation for classes and methods. 100% of students completing the assignment did this correctly.

255 ASSESSMENT: No immediate changes are planned.

CIS 278 SLOs and individual results

SLO 04: Reuse existing components through inheritance and polymorphism. Students performed at a 92% level on the programming project used to measure this SLO. This is a 10% improvement since the last assessment cycle, indicating that introducing the topic sooner in the course has had a positive effect.

SLO 05: Implement, test and debug simple recursive functions. Students performed at a 90% level on the programming project used to

measure this SLO. This is consistent with the last measurement of this SLO, however it is noted that online students do not score as high as the traditional students.

278 ASSESSMENT: Given the difference of performance between the online and face-to-face sections of this course, the instructor will develop more exercises, examples, and demonstrations to recursion.

C**IS 256/279 Individual SLOs' Results and Assessment**
SLO's for this course are measured as one, as these cross-listed courses are essentially the same. The two courses cover the same theory, the only difference being that students code their projects in different languages.

SLO 05: Determine the appropriate data structure to utilize for storing a quantity of data, based on the characteristics of the application. Students performed at a 92% level on the programming project used to measure this SLO. This measurement has improved by 10% since last assessment.

SLO 06: Determine the appropriate implementation of a data structure to utilize in an application, based on time/space trade-offs. Students performed at a 94% level on the exam question used to measure this SLO.

SLO 07: Construct reliable, robust, object oriented solutions to problems involving the storage, retrieval and update of large quantities of data. Students performed at a 97% level on the programming project used to measure this SLO.

SLO 08: Communicate productively in a team software development project. 100% of student debrief surveys indicated that their technical communication skills grew as a result of the team project.

256/279 ASSESSMENT: No immediate changes are planned.

Although other departments do not have regularly-scheduled labs, students in Architecture, Drafting, Engineering classes use the lab to complete assignments and/or the hour(s) by arrangement requirement. Those departments will occasionally reserve the Computer Center for special sessions. BUSW students also use the Computer Center at times when they are unable to use the Business Computer Center.

CIS courses (some with multiple sections) holding regularly-scheduled lab sessions in the CIS Computer Center are CIS 254, 256, 278, and 279.

Other CIS courses with students using the CIS Computer Center are
CIS 110, 111, 113, 114, 117, 121, 125, 127, 128, 132, 151, 255, 363, 364, 379, 380, 420, 479, 489, 490, 491 and 680. In addition, students in the online sections of CIS 110, 254, 256, 278, and 279 will also use the Computer Center.

In 2014 there will be one new CIS course: CIS 135 Android Programming,

Architecture courses using the Computer Center are ARCH 120 and 140.

Drafting courses using the Computer Center are DRAF 110, 111, 121, and 122 (fall 2013).

Engineering courses using the Computer Center are
• ENGR 100 - for roughly half the term in summer and fall (Excel, general internet access, Arduino, MATLAB)
• ENGR 210 - full semester in spring (Solidworks for full term, AutoCAD for a few weeks)
• ENGR 215 - full semester in fall (MATLAB)

In addition, the Engineering uses the lab for club projects (Arduino, Solidworks) and both Architecture and Engineering students use the lab for individual work on assignments for other classes (e.g. writing up lab reports).

B. Center Usage Indicators

1. Review center usage and discuss any differences across demographic variables. Refer to **Planning, Research and Institutional Effectiveness (PRIE) reports**, SARS records, and other data sources as appropriate.

The spring 2013 demographics of 469 Computer Center users show 47.8% of students enrolled in day courses, with 12.4% evening-only, and 39.9% attending both day and evening. 66.3% of students are enrolled in 0.5-12.0 units, and 33.7% are enrolled in more than 12 units. The students are ethnically diverse (with the exception of no Native American respondents). 61.8% of students are under 30 years of age. 48.3% of students are female, and 49.4% are male, with 2.3% unrecorded. 44.8% of students reported a GPA of 3.0 or greater, while 19.2% reported a GPA of 2.0 or lower. 14.1% of respondents are enrolled in Basic Skills Math, English, and/or ESL.

The overall CIS 2012 success rate of 60.3% is lower than the college-wide success rate of 70.1%. And the retention rate of 74% is lower than the college-wide retention rate of 83.9%. However, our department offers a higher percentage of online courses than most other academic departments.

In terms of gender, female students have a success rate of 62.4%, compared to male students with a success rate of 59.2%. Both success rates are lower than the college-wide rates of 71.2% (female) and 69.2% (male). Unrecorded students had a success rate of 73.9%.

The CIS Computer Center's unduplicated student head count in fall 2013 was 598.

A survey of Computer Center users was done in June, 2013. Normally this survey would have been administered in the spring semester, but due to the unfilled Instructional Aide II position, there was unfortunately no one to take charge of the survey. Hence the low number of respondents (only 16) and the lack of significant data.

CIS Computer Center survey results from 2013 show that the Computer Center has helped students improve in their coursework. Students surveyed were from various disciplines, not just CIS. 100% of students found the overall quality of services to be very good or excellent. 100% found the center's staff helpful. 81.3% of students surveyed said they found work done in the Computer Center was either very or moderately helpful in their academic success in course(s) linked to or supported by the Computer Center. It should be noted that 12.5% of respondents were not enrolled in a course linked to the center. Their experience in the Computer Center has also helped them to attain specific SLOs:

Note: unable to include the CIS Computer Center survey results due to errors encountered when pasting the content. Survey can be viewed here:

http://collegeofsanmateo.edu/programreview/docs/lsc_cis/2014/CISComputerCtr2014UserSurvey10-28-2013.pdf

2. Discuss any differences in student usage of center across modes of delivery. If applicable, refer to **Delivery Mode Course Comparison**.

The courses that have traditional as well as online sections, such as CIS 110, CIS 256, CIS 278, and CIS 279, generally have higher rates of completion and success in the traditional sections. Although CIS 110 does not have a regular lab scheduled in the CIS Computer Center, many of those students (traditional and online) complete their assignments in the Computer Center. The traditional sections of CIS 110 have at least one scheduled session in the Computer Center each semester. The success rate of traditional vs. online sections of CIS 110 over 2010-2012 is 63.9% (traditional) compared to 62.2% (online), while the retention rates of 83.5% (traditional) and 84.4% (online) are nearly identical.

CIS 256 is taught once a year in lecture mode, and twice a year online. The success rate of traditional vs. online sections of CIS 256 over 2010-2012 is 92.3% (traditional) compared to 51.9% (online), while the retention rates of 92.3% (traditional) and 77.8% (online) demonstrates greater success for traditional students. A part of that success should be credited to regularly scheduled labs in the CIS Computer Center, as students spend an equal amount of class time in lecture and in the Computer Center.

CIS 278 is taught once or twice a year in lecture mode, and twice a year hybrid/online (not including summer session). The success rate of traditional vs. online sections of CIS 278 from 2010-2012 is 60.7% (traditional) compared to 27.7% (online), while the retention rates of 71.4% (traditional) and 53.2% (online) demonstrates higher success for traditional students. A part of that success should be credited to regularly scheduled labs in the CIS Computer Center.

CIS 279 is taught once a year in lecture mode, and three times a year in hybrid/online mode. The success rate of traditional vs. online sections of CIS 279 from 2010-2012 cannot be made, as there were no traditional sections offered in fall 2010, 2011, or 2012. The distance success rate was 47.8% and distance retention was 69.3.6%.

C. Center Efficiency. Is the center efficient in meeting student needs?

Discuss center efficiency, including staffing, hours of operation, tutorial and other services, space utilization, equipment, or technology as appropriate.

Currently the CIS Computer Center is managed by Zorigt Bazarragchaa, the Instructional Aide II who was hired November, 2013, and six part-time lab aides. The Compute Center is open Monday-Thursday 8:30 am – 8:00 PM and Friday 8:30 am – 2:00 PM. The Computer Center is closed on weekends.

Tutoring is available in the Learning Center. CIS Computer Center lab aides do not provide tutorial services. During formal lab sessions led by instructors there is usually room in the overflow lab in 19-126 for students who are not enrolled in that class. However, the introductory CIS 254 classes are large and need both labs to accommodate all students. That means that other students cannot use the Computer Center during those scheduled lab periods. Some CIS software is installed on several Learning Center computers so CIS students would have an alternative. However, Architecture, Drafting and Engineering (as well as other) students would have to wait until the scheduled lab session is over to access the software that they need.

In addition to tutoring offered in the Learning Center, we should offer tutoring services in the CIS Computer Center. We initially requested this in several previous CIS program review documents. Having a tutor present in the lab would be beneficial to students, who occasionally have need for help but do not require ongoing scheduled tutoring appointments. Computer Center aides are not tutors and are not expected to tutor students. Offering several hours of in-center tutoring would be highly beneficial, and students have requested this kind of help for many years.

Currently the 45 computers are satisfactory and two printers accommodate all students. Only students with an account are able to print, up to a maximum of ten pages. Students in courses with labs scheduled in the center pay a materials fee to cover printing costs.

3. Additional Factors

Discuss additional factors as applicable that impact the center, 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.

Student computer center aides are no longer allowed to lock the center in the evening. Only classified staff and faculty are allowed to have a key, which means that someone must be available in the evening to come and lock the center. This has been problematic. We need to have a new lock installed that does not require a key to lock the door, such as the lock that the Nursing Skills Center has. This would preclude the need for faculty or classified staff to come and physically lock the center in the evening.

The Web and Mobile Application Development AS degree and certificate will, pending state approval, increase enrollment, particularly in intro classes that are required by the more advanced classes. Although most of the curriculum will be offered online, CIS 254 (Intro to Object-Oriented Program Design) is taught in traditional mode. It is possible that we would need to add additional sections of CIS 254, resulting in increased usage of the Computer Center.

The CIS department plans to offer an AS-T degree in Computer Science beginning 2015-2016. This would very likely result in increased enrollment and might require more space and more computers in the CIS Computer Center. In addition, we will offer a revised computer architecture course in traditional format (lecture/lab) that would require use of the Computer Center for the scheduled lab sessions.

Updating the Computer and Network Forensics curriculum as a Cyber Security curriculum would also increase enrollment and might require additional computers and expansion of the current Computer Center.

STATE-WIDE INITIATIVES and COMMUNITY NEEDS

“In 2004, the California Community Colleges Chancellor’s Office was authorized by the state legislature to design and implement a performance measurement system that contained performance indicators for the system and for its colleges. This comprehensive system has become known as “ARCC” (Accountability Reporting for the Community Colleges).”

This State-wide initiative has produced a report that projects there will be employment for those who have Computer Specialist skills. Identifying these skills in the San Mateo County is currently being researched by CIS faculty from all three colleges. The undertaking is funded by the District and will culminate with a newly designed Computer Specialist program. This undertaking is covered in more details in other sections of this Program Review.

TRANSFER REQUIREMENTS

The transfer requirements for a computer science major changed recently to, once again, include computer architecture into the core curriculum. To address this need, the course has been unbanked and redesigned. This was part of the department’s plans in last year’s Program Review. The course will be offered fall 2014 for the first time in many years. The matriculation of all CIS transfer courses are under review by CIS faculty and the dean of counseling. This process should be complete by January 2015.

GENERALLY SPEAKING

Additional factors that affect the CIS department and students include:

1. Students are often under-prepared in the Math/Reading areas, and take courses before they are ready.

2. Non-traditional students may not have attended a college course in many years. It can be difficult for them to establish good study habits and structured learning.

3. The ever-changing nature of CIS requires constant retraining and rethinking of curricula. CIS faculty typically spends summer, spring and/or winter break learning new technologies or updating skills.

4. By design, advanced, more specialized courses are often taught by industry professionals who can offer a 'real world' flavor to the material. Finding good technical adjunct who can also teach can be difficult.

5. All of the department's courses are offered in the distance mode. This requires additional attention and consideration so courses are engaging taught at the same level as the face-to-face.

4. Planning

Note: For centers that serve a single department, a portion of the information included in a departmental program review may be referred to or inserted here.

A. Results of Plans and Actions

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

Plan 1

Title:
2013 -- Relearn and Re-implement the Banked Computer Architecture Course
2013 -- Learn Android and develop a new online Android course
2013 -- Create a CIS Course on an "Open Enrollment" Platform

Completion of last year's plans 1 (Stacey Grasso), 2 (Melissa Green), and 3 (Martha Tilmann)

Description
Projects 1 & 2 involved the development of new courses. They were funded last year by Professional Development. As covered in a previous section of this Program Review, most of the work has been completed, but faculty will finish the project this fall by offering the newly developed courses. Project 3 did not get funded but was pursued as a Mega class with assistance from the Course Technology publisher. Work on this continues.

Action(s)	Completion Date	Measurable Outcome(s)
Teach the two newly developed courses. Teach newly formatted mega class.	Fall 2014 Spring 2015	SLOs will be assessed and appropriate changes made to better serve students.

Plan 2

Title:
Development of a District-wide Computer Specialist Program

Computer Science faculty across the District will participate in this initiative.

NOTE: It is not yet clear if Professional Development (PD) will be required to complete this project. Because the PD proposal deadline may pass before the work load is known, it may be necessary for the District or college to fund this project from other sources.

Description
Computer Science (CS) faculty are involved in an initiative generated by the District to develop a *Computer Specialist* program across the three colleges. Motivated by state and local date indicating there will be job growth in this area, the CS faculty, supported by the District, has launched an extensive survey of local businesses. Data collected will be used to design and implement a program that meets the county's needs in this area. Professional Development or some other source of funding will be required if this involves the development of new courses, and/or major overhauls of existing classes.

Action(s)	Completion Date	Measurable Outcome(s)
Computer Science faculty (funded by the District) surveys local small business.	Summer 2014 -- Fall 2014	Report showing the results of the small business survey.
All District CS faculty meet to develop a *Computer Specialist* program that meets the community needs.	Fall 2014	A curriculum design for the new *Computer Support Specialist* program. Appropriate COI paperwork submitted.
Selected faculty complete the preparations to offer new and/or overhauled courses.	Spring 2015	Faculty are prepared to teach new curriculum.
Officially begin the new program	Fall 2015	New *Computer Specialist* program is launched.

Plan 3

Title: Development of a new *Cyber Security* Program
Faculty: Stacey Grasso NOTE: Professional Development (PD) will be required to complete this project. Because the PD proposal deadline may pass before the plan is fully developed and the work load is known, it may be necessary for the Division or college to fund this project from other sources.

Description
The CIS department has been phasing out the *Computer Forensics* program. Students who are currently enrolled are being shepherded through their final courses. Forensics courses and programs, as indicated in other parts of this report, are being banked. This effort has been accompanied by the exploration of a new *Network Security and Forensics* program that is better tailored to today's industry needs. If after further research and discussion, the department decides to pursue this program, Professional Development or some other source of funding will be required if this involves the development of new courses, and/or major overhauls of classes.

Action(s)	Completion Date	Measurable Outcome(s)
Computer Science faculty, with assistance from the CIS computer lab aide, research the project.	Spring 2014	Report showing the results of the exploration.

CIS faculty design a *Cyber Security* program.	Fall 2014	A curriculum design for the new *Network Security and Forensics* program. Appropriate COI paperwork submitted.
Selected faculty complete the preparations to offer new and/or overhauled courses.	Spring 2015	Faculty are prepared to teach new curriculum.
Officially begin the new program	Fall 2015	New *Cyber Security* program is launched.

B. Center Vision

What is the program's vision for sustaining and improving student learning and success during the *next six years*? Make connections to the **College Mission and Diversity Statements**, **Institutional Priorities, 2008-2013**, and other **Institutional Program Planning** as appropriate. Address trends in the SLO assessment results and student usage and data noted in Section 2.
[**Note:** Specific plans to be implemented in the *next year* should be entered in Section 4C.]

All three full-time faculty are still implementing last year's proposed plans. They are restated here for the reader's convenience.

1. Relearn and Re-implement the Banked Computer Architecture Course
2. Learn Android and develop a new online Android course
3. Create a CIS Course on an "Open Enrollment" Platform

Additionally faculty are involved in an initiative generated by the District to develop a *Computer Specialist* program across the three colleges. This has been detailed in previous parts of this Program Review. As already noted, the goal is to develop a *Computer Specialist* program that meets the county's employment needs. The project starts with an extensive survey of local businesses. Small business assessment will focus on businesses under 100 that employ computer programmers and/or computer support specialist type roles. The following data supports this focus:

EMSI Data

Position	*Annual Projected Openings through 2017*
Computer Programmers	17,600 (620 per year)
Computer Occupations (Other)	6,788 (203 per year)
Computer Support Specialists	20,625 (887 per year)

Counties of San Mateo, San Francisco, and Marin

Small Business Data

Size Categories	Total	0-19	20-49	50-99	100-249	250-499	500-999	1000+
No. of Businesses	82,689	74,752	4,895	1,729	945	222	89	57
No. of Employees	901,137	250,123	148,074	119,809	141,740	74,229	61,245	105,917

Source: CA EDD, Labor Market Information Division, www.labormarketinfo.edd.ca.gov.

Interviews with small businesses will be led by a Skyline faculty on paid leave funded by the District. Interviews will be conducted in

person, at business workplaces.

Based on interview results, a list of required skills will be developed. The required skill sets will be analyzed against existing classes to identify gaps and strengths. A program will be developed accordingly. The assumption is that many program components exist throughout the colleges and could easily be formed/reformed based on skills needed. However, there may also be some the need to develop new curricula. Also based on the interviews, a list or database of companies willing to take internships and advise programs will be developed.

All CSM CIS faculty are involved in this work, but at this time no one has release time. Professional Development may be required if new courses need to be developed.

Finally, the department is exploring the development of a new *Network Security and Forensics* program. The current plan is to bank all the existing Forensic courses, as well as, all related degrees and certificates. This has already been started with an eye to those trailing students finishing the program. If the department decides to move forward with a new *Network Security and Forensics* program, there will be much work to do. Professional Development time will be needed to complete the overall design and paperwork. Later Professional Development time may be needed to develop new courses.

GENERALLY SPEAKING
The Computer and Information Science department will continue to build on its strengths to provide an educational experience that is appropriate to the needs of the community and the computer industry by:

- Continuing the department's commitment to robust programs in transfer and occupational education.
- Supporting and retaining the best faculty and staff.
- Strengthening partnerships with businesses and industry through the Advisory Board,
- Providing a welcoming and intellectually stimulating environment to both the online and campus students.
- Endorsing, supporting and actively pursuing a policy of inclusiveness of all ethnic groups and other diversities.
- Supporting institutional needs identified through program review for updating facilities and equipment to enhance learning environments.

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

The department's efforts this year will be distributed over three areas: the completion of last year's proposed plans, the exploration of a new District-wide Computer Support Specialist program, and the exploration of a new Cyber Security program. No additional funding or release time is required for finishing last year's plans. It is difficult to know the explicit professional activities that will be needed for the Computer Support Specialist and Cyber Security programs. Fall 2014 will be spent researching the areas and determining if the program(s) will move forward. It is fairly certain that at least one, if not both of these programs will come to fruition. It is also likely that release time funding will be needed to complete the design, paperwork, and implementation of the program(s). Consequently this Program Review will ask for funds on a project that is not yet fully defined. It is the hope of the department that if the exploration phase exceeds the submission deadline for Professional Development, the Division could allocate release time for these projects.

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.

There are two issues for which the department could receive better service from the Learning Resources on campus.

1. TUTORS – Firstly, the department is extremely grateful to the Learning Center for providing CIS students tutoring. It is, however, the hope of the department that occasionally a CIS tutor could be provided **in the CIS Computer Center (B19)**. It is here that students clamber for help beyond what the instructor can provide.
2. TEXTS/COURSE MATERIALS – Again, the department is grateful to the Learning Center for its efforts to provide CIS students with current textbooks. What is missing, as mentioned, earlier in this review, is early access to Publisher Websites. This is especially important to the Vets and financial aid students who often spend the first few weeks of the semester waiting for their funding. These students are at an extreme disadvantage without access to the publishers supporting websites.

The department will continue its communications with the CSM Career Services to better serve CIS students regarding jobs and internships. Faculty will also continue to work with the Learning Center to keep them supplied with appropriate textbooks, software, and computer science tutors.

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.

Equipment and Technology

The CIS Computer Center is located in building 19, rooms 124 and 126. It is open to all students but priority is given to CIS, ARCH, ENGR, DRAF, BUSW students. There are 45 desktop computers and 2 printers that will need replacing within the six-year cycle. CIS Computer Center computers were purchased February 19, 2010 and their warranty expired last year on February 20, 2013. They will need to be replaced within two years. One replacement HP M602dn printer was purchased November 30, 2011 and its warranty will expire December 19, 2014. The other printer was purchased in 2006 and needs immediate replacement.

Additionally, faculty will need new high-end computers within this time frame. One instructor needs a Mac computer in addition to her PC.

Instructional Materials

The beginning programming classes use robots for instruction. These will need to be maintained and replaced within the next year or two, as most are six years old.

Classified Staff

In fall 2013 the Business/Technology division hired a new Computer Center Instructional Aide II/CIS, Zorigt Bazarragchaa. This ended a nearly year-long search and completed our staff needs.

Student Assistant

There are 6 part-time computer center aides for ongoing operation. The Computer Center manager leaves at 4:30 PM and aides stay until 8 PM. In addition, aides work daytime shifts.

Facilities

In all the recent upgrades to the campus facilities, it seems building 19 has been virtually ignored. CIS classrooms and computer labs are far from state-of-the-art or innovative. Building 19 has extremely poorly-maintained restrooms. Many students and faculty walk to neighboring building to avoid using these facilities. The building would also greatly benefit from a student sitting area for groups to congregate, socialize, and study. Most other building on campus provides this for students, but not building 19.

The CIS Computer Center needs an automatic lock so that the center can be locked at night without needing faculty or classified staff. The Nursing Skills Center currently has a lock like this.

C. 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.)

Plan 1

Title:
2013 -- Relearn and Re-implement the Banked Computer Architecture Course
2013 -- Learn Android and develop a new online Android course
2013 -- Create a CIS Course on an “Open Enrollment” Platform

Completion of last year's plans 1 (Stacey Grasso), 2 (Melissa Green), and 3 (Martha Tilmann)

Description

Projects 1 & 2 involved the development of new courses. They were funded last year by Professional Development. As covered in a previous section of this Program Review, most of the work has been completed, but faculty will finish the project this fall by offering the newly developed courses. Project 3 did not get funded but was pursued as a Mega class with assistance from the Course Technology publisher. Work on this continues.

Action(s)	Completion Date	Measurable Outcome(s)
Teach the two newly developed courses. Teach newly formatted mega class.	Fall 2014 Spring 2015	SLOs will be assessed and appropriate changes made to better serve students.

Plan 2

Title:

Development of a District-wide Computer Specialist Program

Computer Science faculty across the District will participate in this initiative.

NOTE: It is not yet clear if Professional Development (PD) will be required to complete this project. Because the PD proposal deadline may pass before the work load is known, it may be necessary for the District or college to fund this project from other sources.

Description

Computer Science (CS) faculty are involved in an initiative generated by the District to develop a *Computer Specialist* program across the three colleges. Motivated by state and local date indicating there will be job growth in this area, the CS faculty, supported by the District, has launched an extensive survey of local businesses. Data collected will be used to design and implement a program that meets the county's needs in this area. Professional Development or some other source of funding will be required if this involves the development of new courses, and/or major overhauls of existing classes.

Action(s)	Completion Date	Measurable Outcome(s)
Computer Science faculty (funded by the District) surveys local small business.	Summer 2014 -- Fall 2014	Report showing the results of the small business survey.
All District CS faculty meet to develop a *Computer Specialist* program that meets the community needs.	Fall 2014	A curriculum design for the new *Computer Specialist* program. Appropriate COI paperwork submitted.
Selected faculty complete the preparations to offer new and/or overhauled courses.	Spring 2015	Faculty are prepared to teach new curriculum.
Officially begin the new program	Fall 2015	New *Computer Specialist* program is launched.

Plan 3

Title:
Development of a new *Network Security and Forensics* Program

Faculty: Stacey Grasso

NOTE: Professional Development (PD) will be required to complete this project. Because the PD proposal deadline may pass before the plan is fully developed and the work load is known, it may be necessary for the Division or college to fund this project from other sources.

Description

The CIS department has been phasing out the *Computer Forensics* program. Students who are currently enrolled are being shepherded through their final courses. Forensics courses and programs, as indicated in other parts of this report, are being banked. This effort has been accompanied by the exploration of a new *Network Security and Forensics* program that is better tailored to today's industry needs. If after further research and discussion, the department decides to pursue this program, Professional Development or some other source of funding will be required if this involves the development of new courses, and/or major overhauls of classes.

Action(s)	Completion Date	Measurable Outcome(s)
Computer Science faculty, with assistance from the CIS computer lab aide, research the project.	Spring 2014	Report showing the results of the exploration.
CIS faculty design a *Network Security and Forensics*program.	Fall 2014	A curriculum design for the new *Network Security and Forensics* program. Appropriate COI paperwork submitted.
Selected faculty complete the preparations to offer new and/or overhauled courses.	Spring 2015	Faculty are prepared to teach new curriculum.
Officially begin the new program	Fall 2015	New *Network Security and Forensics* program is launched.

5. Resource Requests

Itemized Resource Requests

List the resources needed for ongoing program operation and to implement the plans listed above.

Equipment and Technology

Description	Cost
Web server to support the Web and Mobile Application Development degree/certificate and Internet Programming certificate.	$2,159.99
The CIS Computer Center has 45 desktop computers will need replacement	

within the next two years.	
Additionally, faculty members will need new high-end computers within this time frame.	$4,000
One instructor needs a Mac computer in addition to her PC.	$1,000
Immediate replacement for one lab printer purchased in 2006 and out of warranty in 2008.	$1,167.17

Instructional Materials

Description	Cost	
All Lego Mindstorms robots (except for the 4 replacement robots purchased in 2013) are out of warranty and most are 6 years old. 32 new robots will be needed.	$9,279.60	
Camtasia Software for faculty laptops (enhances online delivery)		$900 ($300 x 3)

Classified Staff

Description	Cost
Instructional Aide II/CIS position was finally filled November, 2013.	

Student Assistant

Description	Cost
6 part-time computer center aides for ongoing operation	930 hours per semester of paid time ($12-$13.25/hr) $12,322.50

Facilities

For immediate or routine facilities requests, submit a CSM Facility Project Request Form.

Description	Cost
Remodel restrooms on both floors of Building 19	Cost ..unknown
Add a student lounge (minimally put benches in hallways)	Cost ..unknown
Automatic lock for the CIS Computer Center 19-124 (similar to Nursing Skills Center)	Cost ..unknown

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.

Degrees/Certificates to UPDATE	Faculty Contact	Action	Submission Date
AS: Computer and Information Science	---	No Action	----
AS: Computer and Network Forensics*	Tilmann	BANK	Fall 14
AS: Computer Science Applications and Development	---	No Action	----
AS: Web and Mobile Application Development (NEW)	Green	Waiting State Approval	??
CA: Computer and Network Forensics*	Tilmann	BANK	Fall 14
CA: Computer Science Applications and Development	---	No Action	----
CS: C++ Programming	---	No Action	----
CS: CIS Network Security Specialist	Tilmann	BANK	Fall 14
CS: Computer Forensics	Tilmann	BANK	Fall 14
CS: Internet Programming	---	No Action	----
CS: Java Programming	---	No Action	----

Course UPDATES		Faculty Contact	Submission Date
CIS 110	INTRODUCTION TO COMPUTER AND INFORMATION SCIENCE	Tilmann	Fall 14
CIS 111	INTRODUCTION TO INTERNET PROGRAMMING	Green	Fall 14
CIS 113	INTERNET PROGRAMMING: RUBY	Green	Fall 14
CIS 114	INTERNET PROGRAMMING: JAVASCRIPT/AJAX	Green	Fall 14
CIS 117	INTERNET PROGRAMMING: PYTHON	Green	
CIS 121	UNIX/LINUX	Tilmann	Fall 14

CIS 125	VISUAL BASIC I	Tilmann	Fall 14
CIS 127	INTERNET PROGRAMMING: HTML5 and CSS	Green	Fall 14
CIS 128	MOBILE WEB APP DEVELOPMENT	Green	Fall 14
CIS 132	INTRODUCTION TO DATABASES	Green	Fall 14
CIS 135	ANDROID	Green	Fall 15
CIS 151	NETWORKS AND DIGITAL COMMUNICATION	Green	Fall 14
CIS 200	CAPSTONE PROJECT - CIS	Green	Fall 14
CIS 254	INTRODUCTION TO OBJECT-ORIENTED PROGRAM DESIGN	Grasso	Fall 15
CIS 255	(CS1) PROGRAMMING METHODS: JAVA	Grasso	Fall 15
CIS 256	(CS2) DATA STRUCTURES: JAVA	Grasso	Fall 15
CIS 264	COMPUTER ARCHITECTURE	Grasso	Fall 15
CIS 278	(CS1) PROGRAMMING METHODS: C++	Grasso	Fall 15
CIS 279	(CS2) DATA STRUCTURES: C++	Grasso	Fall 15
CIS 363	ENTERPRISE DATABASE MANAGEMENT WITH MySQL	Green	Fall 14
CIS 364	ENTERPRISE DATA WAREHOUSING	Grasso	Fall 15
CIS 379	INTERNET PROGRAMMING: XML	Green	Fall 14
CIS 380	INTERNET PROGRAMMING: PHP	Green	Fall 14
CIS 420	PROJECT MANAGEMENT PROFESSIONAL CERTIFICATE PREPARATION	Grasso	Fall 14
CIS 479	NETWORK SECURITY FUNDAMENTALS	Green	Fall 14
CIS 489	COMPUTER FORENSICS	Tilmann	Fall 14 (to be banked)
CIS 490	COMPUTER FORENSICS: NETWORK ANALYSIS AND DEFENSE	Tilmann	Fall 14 (to be banked)
CIS 491	COMPUTER FORENSICS: SEARCH AND SEIZURE	Tilmann	Fall 14 (to be banked)

CIS 492	COMPUTER FORENSICS: WHITE-COLLAR CRIME	Tilmann	Fall 14 (to be banked)

B. Website Review

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

Faculty contact(s)	Date of next review/update
Stacey Grasso (faculty)	Last updated: 12/13
Michelle Schneider (Division input person)	Updated as needed.

C. SLO Assessment Contacts

	Date of next review/update
Melissa Green	Spring 15, Ongoing
Stacey Grasso	Spring 15, Ongoing
Martha Tilmann	Spring 15, Ongoing
Lilya Vorobey (Division input person)	Ongoing